Vol. II.

TRANSCRIPT OF RECORD.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1922.

No. 339.

TOLEDO SCALE COMPANY, PETITIONER,

vs.

THE COMPUTING SCALE COMPANY.

No. 388.

FIDELITY AND DEPOSIT COMPANY OF MARYLAND AND UNITED STATES FIDELITY AND GUARANTY COMPANY, PETITIONERS,

vs.

THE COMPUTING SCALE COMPANY AND TOLEDO SCALE COMPANY.

ON WRITS OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SEVENTH CIRCUIT.

PETITIONS FOR CERTIORARI FILED MAY 15, 1923.

WRITS OF CERTIORARI AND RETURN FILED AUGUST 4, 1923.

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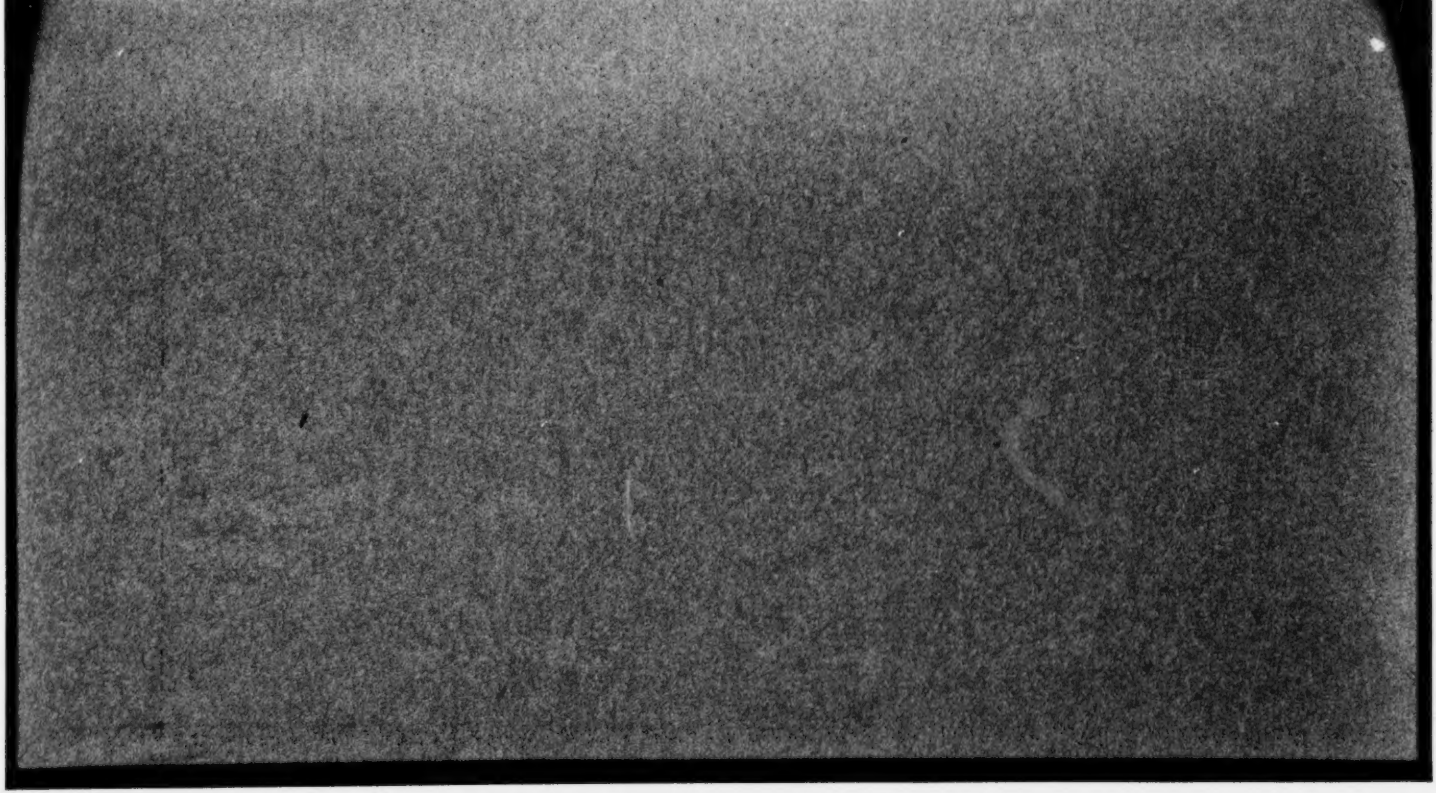

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IN THE UNITED STATES DISTRICT COURT

For the Northern District of Illinois,

Eastern Division.

The Computing Scale Company
vs.
Toledo Computing Scale Company,
} In Equity. No. 30,024.

NOTICE.

To Messrs. Sheridan, Wilkinson, Scott & Richmond, Marquette Bldg., Chicago.

Gentlemen:—

You are hereby notified that we shall resume the introduction of proofs on behalf of the defendant in the above entitled cause under the 67th Equity Rule as amended and in accordance with the stipulation hereinbefore made between the parties to said cause by their counsel, before Nelson H. House, Notary Public for Wayne County, Michigan, at his office at 433 Majestic Building, Detroit, Michigan, beginning at ten o'clock in the forenoon of Tuesday, February 6, 1912, subject to adjournment to Erie, Pennsylvania, at the office of Hugh C. Lord, Eighth and State Streets, before Charles Brevillier, Notary Public for Erie County, Pennsylvania, and adjournment to Beaver Falls, Pennsylvania, before a competent Notary or other officer, and adjournment to Toledo, Ohio, before Solon T. Klotz, Notary Public for Lucas County, Ohio, at the office of Owen & Owen, Nicholas Bldg. The witness to be examined are John H. Milburn, a resident of Detroit, Michigan; Frank C. Bacon, a resident of Erie, Pennsylvania; William Davis, a resident of Beaver Falls, Pennsylvania; Orvell C. Reeves, a resident of Toledo, Ohio, and perhaps others. The examination will continue from day to day until completed and you are invited to attend on behalf of the complainant.

RECTOR, HIBBEN, DAVIS & MACAULEY,
Solicitors for Defendant.

Chicago, February 3, 1912.

Service of the above notice acknowledged this 3rd day of February, 1912.

SHERIDAN, WILKINSON, SCOTT & RICHMOND,
Solicitors for Complainant.

IN THE UNITED STATES DISTRICT COURT

For the Northern District of Illinois,

Eastern Division.

The Computing Scale Company, *Complainant,*
vs.
Toledo Computing Scale Company, *Defendant.*
} In Equity. No. 30,024.

Testimony on behalf of the defendant in the above entitled cause, taken pursuant to notice before A. W. Smith, Notary Public, at Room 522 Pontchartrain Hotel, Detroit, Michigan, on Tuesday, the 6th day of February, A. D. 1912, beginning at 11:30 o'clock A. M.

Appearances: Carl A. Richmond, Esq., for complainant; John B. Macauley, Esq., for defendant.

JOHN H. MILBURN, a witness recalled on behalf of defendant, testified as follows, in answer to interrogatories propounded by Mr. Macauley:

Q. 1. Are you the same John H. Milburn who previously testified in this case?

A. I am.

Q. 2. Will you please describe as fully as possible the automatic computing scale referred to in your answers to XQs. 65, 66 and 67, in your deposition taken at Toledo, Ohio, January 27, 1912?

A. The scale referred to is a scale mounted,—or I should have said a cylinder,—mounted in a wood frame. The cylinders are separated running on the same shaft through the center of a paper drum, journaled in the wood frame by a brass bushing. The resistance for the scale weight are composed of two gravity weights hung and pivoted directly underneath the wood frame. On the downward pull with the load each weight raises in opposite direction to each other. The cylinder is made by rolling two layers of manila paper over a form, pasting each layer together. There are end pieces or spiders made of very light metal material, which

support the paper drum. The shaft, as said before, supporting the spider ends of the cylinder.

Q. 2*a*. In the scale of this type which you first constructed, how was the cylinder arranged—that is to say, was it a continuous cylinder, or a plurality of cylinders?

A. The first one I made was a single cylinder operated from one end, but finding that not satisfactory, on account of overbalancing, I concluded to change it by making a double cylinder pulling directly from the center by a rack and pinion.

Q. 3. The first cylinder was turned from one end?

A. Yes; turned or revolved.

Q. 4. And your theory was that the difficulty arose from this fact?

A. Yes, the difficulty was in that respect.

Q. 5. What other change did you make at this time, if any, in the construction of the scale?

A. At that time, which was in St. Louis, I dropped the matter for the time being, expecting to leave there for Dayton, Ohio.

Q. 6. I understand, then, that you made no other change in the scale at St. Louis; is that correct?

A. Yes, sir; as near as I can remember.

Q. 7. When did you leave St. Louis?

A. In the summer of 1894.

Q. 8. Have you any letters or other documentary evidence by which you can fix the time when you left St. Louis?

A. I'm not positive, but I think probably I may have some letters exchanged between my wife and myself at that time; I'll see.

Q. 9. Will you please get those letters if you can find them, after our next adjournment?

A. I will; yes, sir.

Q. 10. You are certain, however, are you, that you left St. Louis in 1894?

Objected to as leading.

A. Yes, sir.

Q. 11. Have you any sketch or drawing illustrating this scale which you made in St. Louis?

A. I have.

Q. 12. Will you please produce it?

A. Yes, here it is, right in my hand.

By Mr. Macauley: The drawing referred to is offered in evidence, with the request that it be marked "Defendant's Exhibit, Drawing of Milburn Scale."

By Mr. Richmond: Objected to as irrelevant, immaterial and incompetent, and not properly proved.

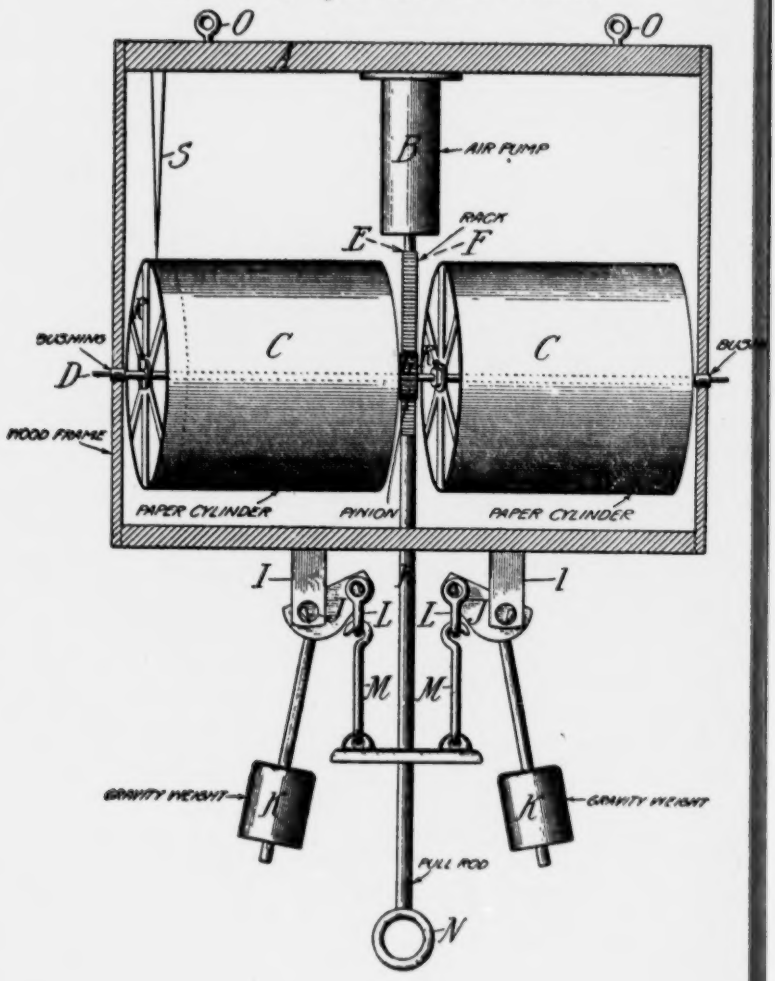
Q. 13. Who made this drawing?

A. I made the drawing.

Q. 14. When was it made?

A. Last Wednesday.

Defendants Exhibit
Drawing of Milburn Scale



Q. 15. From what did you make the drawing?

A. From the original parts and pieces that I could collect together from the old St. Louis scale.

Q. 16. This was the only information you had except your memory, was it?

A. Yes, sir.

Q. 17. I will ask you to identify the various features of this drawing, using letters of reference which you may put upon the drawing.

A. A is the wood frame; B is the air pump; C is the cylinder; D is the shaft running through the cylinder; E is the plunger for air pump; F is the rack; G is the pinion; H is the pull rod; I is the fulcrum; J is the pivot head; K is the gravity weight; L is the loop; M is the pitman actuating the weight head.

Q. 18. Where was the article to be weighed placed?

A. Suspended through the eye N.

Q. 19. How was the scale supported?

A. By two eyes O, at each end of the wood frame, at the top.

Q. 20. The scale then was a hanging scale, was it?

A. Yes, sir.

Q. 21. What was the construction and purpose of the air pump B?

A. It was to settle the momentum of the paper drum.

Q. 22. What were parts of this air pump?

A. That was made out of one-inch brass tubing, with a plunger fitting very tightly just allowing a very small portion of the forced air to pass between the casing and the plunger.

Q. 23. To what was the cylinder connected?

A. To a rod running direct through the center journaled at each end by a brass bushing inserted in the wood frame.

Q. 24. To what was the cylinder of the air pump connected?

A. That was bolted to the upper part of the wood frame.

Q. 25. To what was the piston of the pump connected?

A. It was connected to the pull rod and rack, H and F.

Q. 26. Was the pinion fast or loose upon the shaft?

A. The pinion was fast.

Q. 27. By "settling" the scale, you mean bringing it to rest?

A. Bringing it to rest, yes, as the load went on.

Q. 28. I notice that the rod H appears to be divided by a lower cross-piece of the frame; is this the construction?

A. It was constructed with a hole through the bottom rail of the wood frame, allowing the pull rod to pass through.

Q. 29. How were the cylinders supported from the shaft?

A. By metal ends or spiders made as light as possible.

Q. 30. Will you put the letter R on these ends or spiders?

A. I have done so.

Q. 31. Can you describe the construction of these end pieces a little more closely?

A. The first two I made for the first scale that was constructed were made of very light brass, with the rim sweated on. When I changed the scale to the double cylinder, I made a form and spun the flange on a lathe, making them all in one piece instead of two, as in the first place.

Q. 32. Who made the various inscriptions upon this drawing?

A. I made them myself.

Q. 33. What was the material of the rod H?

A. It was made out of rolled brass.

Q. 34. And out of what were the pivot heads J made?

A. Made out of cast brass.

Q. 35. And the gravity weights were of what material?

A. I used for the gravity weights some old brass balance weights that we used on another scale that was in progress of manufacture at the time.

Q. 36. Did you test this scale in any way?

A. Yes, sir.

Q. 37. What did you find out by your tests, and how did you make them?

A. I penciled on a strip of paper large enough to insert in the outside of the paper drum from 1 up to 20 pounds, then I pasted it on the outside circumference of the drum. I used a temporary indicator coming down from the top of the wood frame, which I have now drawn illustrating the idea, as will be shown by letter S.

Q. 38. What then did you do in the way of using this scale, or trying it?

A. In order to get at the correctness of the scale to see that it pulled to its correct graduations on the penciled strip, T, we had our standard weights placed on a hanging platform through eye N, which was tried from one pound up to its full capacity, which was twenty pounds.

Q. 39. Did you try the same weight more than once on the scale?

A. Yes, fifty times; we had to do that to adjust our gravity weights properly.

Q. 40. How closely did the cylinder return to the same point at different weighings with the same weight?

A. The first few trials in testing the scale showed a fraction of an ounce of variation, not much to speak of. Finally by working, taking all friction as much as possible away I found it to work about as successful as any spring scale.

Q. 41. It was accurate within sufficient limits for actual use, was it?

Objected to as leading.

A. Yes, sir.

Q. 42. Of what material were the drums or cylinders composed?

A. They were formed on a wooden form by wrapping a couple of layers of very light manila paper pasted together.

Q. 43. How would the manila paper which you used compare in thickness with the paper upon which you have made the drawing "Defendant's Exhibit Drawing of Milburn Scale"?

A. I think the first was about the thickness of this paper.

Q. 44. By "the first," what do you mean?

A. The first that I made in St. Louis.

Q. 45. How was this paper secured to the spiders?

A. By sewing through the paper down to the spokes of the spider, then wound around the spider and tied to each spoke.

Q. 46. What was the material that you used for this purpose?

A. Linen thread.

Q. 47. What became of this scale?

A. I have part of it with me.

Q. 48. Then it was dismantled?

A. Yes, sir.

Q. 49. When was it dismantled, as near as you can state?

A. After moving from New York City to Detroit I took a notion to try the scale out again. I unpacked some old things, and among them I found the scale which I had first constructed in St. Louis. I hung it up and tried it over with the expectation of making drawings and getting a patent issued. Then I thought the matter over, after seeing one of

DeVilbiss' scales, I didn't know but what I might go up against an interference case in the Patent Office, so I abandoned the idea of patenting the scale.

Q. 50. What did you do then with the actual scale which you had made?

A. I just simply took it down and practically used it and treated it as so much junk.

Q. 51. What became of the parts of the scale other than the ones which you say you have here?

A. It is a hard matter to say what has become of them. I know I tried to hunt them out and all I could find are what I have here.

Q. 52. How far did you carry this search for the other parts?

A. Probably it was all counted in about six or eight hours.

Q. 53. Please state just generally where you searched.

A. I first searched through my experimental room, then up in the attic and finally I landed them up in the loft of my shed.

Q. 54. These were the only places, were they, where such articles would be apt to be found around your residence?

A. Yes, sir.

Q. 55. Will you please produce the parts of the scale which you have with you?

A. I have done so.

Q. 56. Will you please tell us what each of these parts is?

A. I have four of the end pieces or spiders that support the paper cylinder; the next I have one of the gravity weights and head complete; I have also two cam disks that was tried out on the same scale, operated by a band movement.

Q. 57. Referring now to the spiders or end pieces which you have produced, I note that one pair therof appears to be of brass and the other pair of iron. Will you please explain how this happens to be so?

A. The iron in the first place was lighter than the brass, which I thought could be formed just about as easy by preparing the right tools and would be stronger than the brass, which if you will notice, they are.

Q. 58. Which of these pairs of ends were made first, and please explain the making of them?

A. The first two that was used on the first scale the single cylinder was made out of brass, the body being cut out

of a sheet and the rim or flange was sweated to the outer edge of the same.

Q. 59. How were these end pieces secured to the shaft?

A. There was a temporary hub screwed to the center admitting the shaft with a set-screw running down through hub onto the shaft.

Q. 60. I notice that upon one of the brass spiders there is no securing means; will you please explain why this is so?

A. It has simply been taken off and used for some other purpose; as you will notice, it is simply held there by two small No. 4 screws.

Q. 61. In the scale as made at St. Louis were the brass pivot heads or the wooden ones employed?

A. I tried both.

Q. 62. How were the wooden pivot heads used?

A. They were pivoted in the center with the gravity weight stem screwed to the bottom side. Then there was a thin metal band, ⅜ inch wide, secured in crotch of the head which acted as a rotary or pull down throwing out the gravity weights.

Q. 63. Were both these constructions tested, or only one?

A. They were both tested.

By Mr. Macauley: The scale parts produced by the witness are offered in evidence, with the request that the brass spiders be marked "Defendant's Exhibit Milburn Scale Brass Spiders," the iron spiders be marked "Defendant's Exhibit Milburn Scale Iron Spiders," the gravity weight, including the brass pivot head, be marked "Defendant's Exhibit Milburn Scale Gravity Weight," and the wooden pivot heads be marked "Defendant's Exhibit Milburn Scale Wooden Pivot Heads."

By Mr. Richmond: The exhibits are objected to as immaterial and incompetent and not adequately proved.

Q. 64. Where did you go immediately on leaving St. Louis?

A. Dayton, Ohio.

Q. 65. And from Dayton, Ohio, where?

A. Beaver Falls.

Q. 66. And what was your next move?

A. I went back to Dayton, then from Dayton to Elkhart, Indiana, to do some experimental work for the Stimpson Scale Company; went from there to Philadelphia, and did some work for the Keystone Scale Company; got through there, and went to New York City, was foreman for the

O'Brien Scale Company, in Chambers Street at that time; I left there and came to Detroit to develop the combination trunk scale for the American Harrow Company of this city; I then engaged, after getting through there, went over to Pembroke, Canada, to start a business for the Delahay Brothers, and returned to Detroit, and have been here ever since.

Q. 67. Have the parts of the scale produced by you at this hearing been in your possession ever since you left St. Louis?

A. Yes, sir; but remember I didn't take them to all these places I have mentioned, my family didn't go with me.

Q. 68. Are these parts in the same or different condition from what they were in St. Louis?

A. Yes, practically the same, with the exception I moved this fulcrum pivot (pointing to the pivot in the brass pivot head) I think $\frac{3}{8}$ of an inch,—that is all the alteration that was made, in that pivot head.

Q. 69. I notice in the pivot head a perforation which would apparently fit the pivot knife,—was this the hole through which it originally passed?

A. Yes.

Q. 70. Where was this scale made in St. Louis—at your house, or where?

A. It was made in my experimental room at the factory.

Q. 71. Who had access to this room at that time?

A. Nobody was allowed in the room but myself.

Q. 72. Can you name any persons who may have seen the scale?

A. The only ones that I can think might have seen the scale hanging up would be my eldest son, who is out of town, where I don't know at the present time; I am trying to locate him.

Q. 73. Is there anyone else who might possibly have seen or know something about it?

A. There is a possibility my brother Charles, of Beaver Falls, Pennsylvania, might have seen it.

Q. 74. What is your brother's address at Beaver Falls?

A. I think it is 1224 Sixth Avenue—I think that it is.

Recess to 2:30 P. M.

2:30 P. M.

Q. 75. At the morning session I asked you to look for any papers which might assist you in fixing the time when you left St. Louis. Have you looked for these letters?

A. Yes, sir.

Q. 76. Have you found any such letters which would refresh your memory in that respect?

A. I have two letters here, which I remember receiving shortly after leaving St. Louis?

Q. 77. What are the dates of those letters, and from whom are they?

A. The first one is from a man by the name of Walter Bond, signing his name "Walt," who was the bookkeeper for the Milburn Scale Company at St. Louis; the second one I have here is from F. W. Browning, a bookkeeper for the Home Novelty Manufacturing Company of St. Louis. The first one is dated June 4, 1894; the second December 19, 1894.

Q. 78. You are sure, are you, that these letters were received by you subsequent to the date which they bear and shortly thereafter, and after you had left St. Louis?

Objected to as leading.

A. Yes, sir.

By Mr. Macauley: The letters are offered to counsel for complainant for inspection.

Q. 79. Did you ever return to St. Louis after you left there, in 1894?

A. I went there in the fore part of 1896, from Beaver Falls, but on a business errand for the Beaver Falls Computing Scale Company.

Q. 80. How long were you there at that time?

A. Two full days.

Q. 81. Can you remember approximately how long it was before you left St. Louis that you made the first automatic computing scale, to-wit, one in which the cylinder was turned by the movement of the scale parts,—*i. e.*, the scale with the single cylinder?

A. I started that early the spring of 1894, it was I guess the first month in 1894.

Q. 82. How long before you finished it?

A. I had it in working order—well, from the time I started to the time that I demonstrated the machine as being practical for weighing, was about two weeks.

Q. 83. And then how long after that was it before you made the divided cylinder scale?

A. Well, I found that of course the single cylinder wasn't a success. I went right to work immediately and changed around to the double cylinder.

Q. 84. Do you know about how long that took you?

A. It took me about four days, I think; less than a week.

Q. 85. You have said that your brother and son might possibly have seen the scale in St. Louis; are these all the persons that you think have seen it?

A. Yes; I kept that work so closely guarded that I didn't admit anybody outside of my own family in the room where I was conducting the experiments.

Q. 86. The parts which you have produced here and which have been offered in evidence are the only parts of the automatic computing scale which you made that you are able to find, are they?

A. Yes, sir.

Cross-Examination by Mr. Richmond.

XQ. 87. When you left St. Louis in 1894, what became of that scale you have been telling about?

A. I took it down, packed it in a box I had made purposely for all my private experimental parts that I had been working on and shipped it to Dayton, Ohio, with some other private things that I had.

XQ. 88. How long did it stay at Dayton, and where did it go from there?

A. It stayed in Dayton for about two months, three months probably, then I shipped all my furniture and belongings to Beaver Falls, Pennsylvania.

XQ. 89. What kind of a chart did it have?

A. It had the chart that I made after I had experimented with the pound and ounce band; I penciled it out on paper, giving the price per pound of everything weighed, to twenty pounds.

XQ. 90. Did the drum turn around just once to make twenty pounds?

A. Yes, sir; one revolution.

XQ. 91. And just one-twentieth as much for each added pound?

A. Yes, the spaces were equalized.

XQ. 92. You say the chart was filled out with the prices in pencil?

A. Yes; it being an experimental piece of work, of course, it was penciled out roughly, so as to give the idea of what the scale would do.

XQ. 93. Were the prices filled in with pencil all over the chart, or just part way?

A. No; the spaces were there, but the figuring was only alternate—it wasn't really filled out, the spacing was there to show that the scale indicated correctly.

XQ. 94. How long did the scale stay at Beaver Falls, and where did it go then?

A. It stayed in Beaver Falls until 1898. When I moved to Philadelphia I left all that kind of stuff right in the factory at Beaver Falls; I didn't move it, but my brother Charles, who remained in Beaver Falls after I left, forwarded them to me after I moved to Detroit.

XQ. 95. When was the scale first unpacked after leaving St. Louis?

A. I don't think, as far as my memory will carry me, that it was unpacked until I received it in Detroit.

XQ. 96. When was it that it was first set up and unpacked after leaving St. Louis?

A. The summer of 1898, the time of the Spanish war.

XQ. 97. Did you put the incomplete pencil marking on the drum after the drum was made, or before the chart was shaped?

A. I simply took a piece of light paper, as light as I could get and as strong as possible, and laid it out in the flat, getting my right measurements for the circumference of the drum; after I spaced it out I just simply put it over the paper drum and pasted it on.

XQ. 98. Then the drum consisted of several thicknesses of paper with an additional chart sheet, incompletely marked in pencil, and pasted on the outside, did it?

A. No; there were two thicknesses contained in the drum, there was one thickness of the chart, making three layers after it was finished.

XQ. 99. Did you ever take any steps toward applying for a patent on this scale?

A. No, sir.

XQ. 100. Why not?

A. Well, from the first time that I started on the scale in St. Louis and up to the time I worked on it at Detroit, I

had seen the DeVilbiss scale; thinking that I might if applying for a patent run up against an interference, or if any patent had been issued it would probably have been an infringement, so I dropped it on thinking the matter over on that point.

XQ. 101. When is it you mean you dropped it?

A. I dropped the idea of getting it patented.

XQ. 102. When was it that you dropped this idea of getting it patented?

A. When it was hanging up in condition, in 1898, in my experimental room in Detroit.

XQ. 103. After you unpacked it in Detroit what changes did you make in it?

A. I lessened the journal, turned it down smaller, that worked in the end bushings in the wood frame, to take off all the friction I possibly could. I also balanced the drum absolutely perfect, so that there would be no variation in the revolution of the drums.

XQ. 104. Did you make any other changes at this time?

A. Yes, I did; that's the time I think that I tried out the wood disks, pivoted in the center, operated by a light phosphor bronze band.

XQ. 105. Did you make any other changes at Detroit?

A. I can't think of any more.

XQ. 106. When you got through with these changes, did you leave the scale with the wood disks in place?

A. No, I did not; the whole thing was taken down and put in a box that I had for that purpose of keeping my odds and ends. I recall now the fact that I did make another small change in getting the different leverage on the pivot head.

XQ. 107. Did you have to change the chart when you put those wooden disks on?

A. No, sir. That all depended on the leverage of the gravity weight, and I think that I had to either put that down further or pull it up further; I can't remember which.

XQ. 108. You mean you had to change the length of the arm carrying the weight?

A. Yes, sir, or else load it up in some way; now there was something to that that really I have forgotten but that was the condition, the disks have a different leverage to the pivot head there, and I figured that out from bearing to bearing, that would be like taking the distance between the pivots on the pivot head, and then getting the same distance on the wood disk, the bearing of the pivot to the outer edge of the

disk. The result should be practically the same, and I think there was very little difference in the adjustment after I did put this in in exchange for the pivot head.

XQ. 109. You mean you didn't have to change the weight much?

A. Yes, that's what I mean.

XQ. 110. What was your idea in making these changes at Detroit, such as substituting the wooden disks and changing the size of the bearings, etc.?

A. To get a more accurate and easier working scale.

XQ. 111. Just what do you mean by easier working?

A. That is taking all the possible friction off the working part.

XQ. 112. Did you ever make any investigation or have any investigation made to see whether there was any patent difficulty with regard to this scale that you have been testifying about?

A. No further than I made myself.

XQ. 113. Please state just what you refer to by this excepted possible investigation that you made yourself.

A. In the meantime I had seen one of the DeVilbiss scales operated by the gravity weight system, and thinking that they might possibly have certain claims, I didn't feel like going very far with it and also spending money to probably defend it.

XQ. 114. Did you make any inquiry or investigation to learn whether they actually had any such claims?

A. No, sir; I did not.

XQ. 115. Had you ever applied for any patent on the scale that you manufactured in St. Louis like the one shown on the envelope that is in evidence in this case?

A. Yes, it seems to be by a letter that I had.

XQ. 116. Will you please show me the letter?

A. That is the letter (handing same to counsel).

XQ. 117. Did you apply for a patent on the scale that you testified about at Toledo, January 27, 1912, and if so, on what date did you make the application?

A. Are you referring to the St. Louis scale, Mr. Richmond?

XQ. 118. Yes, the scale like the one shown on the envelope that has been made an exhibit in this case?

A. Well, as near as I can make out by finding this letter today it seems to me that I applied for the patent, but in my former testimony I had forgotten all about it?

XQ. 119. On what date was your application filed?

A. Well, according to this letter which I hold, it was May 23, 1894.

XQ. 120. Referring now to the experimental scale with the automatically revolving drum that you made in St. Louis, did you have any way to adjust it so that it would read at zero when there was no load on the platform?

A. Yes, that was done by counterbalancing the drums.

XQ. 121. Just where was the counterbalance applied?

A. It was simply in under the pan that was suspended from the pull rod; you could put to or take from or lighten with lead or other material to counterbalance.

XQ. 122. Can you remember about how sensitive it was, that is, with a load of, say ten pounds, how close together could you get a dozen readings, taking the weight off and putting it on each time?

A. A fraction of an ounce it would vary; about an eighth of an ounce, I should say.

XQ. 123. What was the size of the shaft for the revolving drum?

A. The shaft was 3/16.

XQ. 124. Was there any tendency to spring the shaft with the gear at the middle and the bearings so far out at the ends?

A. I never experienced anything of the kind in trying it out.

XQ. 125. When you set the scale up and experimented with it in Detroit, did you show it to anyone, or talk it over with anyone?

A. No one outside of my immediate family.

XQ. 126. You mean the same individuals to whom you showed it in St. Louis?

A. Yes, sir.

XQ. 127. Did you try different sizes or shapes of wooden disks?

A. No, sir.

XQ. 128. Had you applied for many patents before you left St. Louis—I mean in relation to scales that you were working upon?

A. I only applied for the one patent while I was in St. Louis.

XQ. 129. How about before you went to St. Louis?

A. Before I went to St. Louis my patent was issued in

1891, October 6, that was the patent we worked on in St. Louis.

XQ. 130. Before you left St. Louis had you ever applied for any other patents relating to your work on scales other than those you have just mentioned?

A. No, nothing.

XQ. 131. Was it the idea of using a weight swung on the end of an arm like a pendulum counterbalancing the load that you thought would stand in your way in the DeVilbiss scale?

A. Well, not only exactly the pendulum weight, but the use it was put to and how it was constructed, used for the purpose of a resistant weight to do away with a spring scale.

XQ. 132. You knew, didn't you, that it was very old to use such a weight to balance the load?

A. Yes; I have an old cut here that refers to it about thirty-four years ago, but it's in a different form to what it is now in the DeVilbiss scale, and another thing, this cut represents only a plain, ordinary weighing device, not pertaining to computing at all.

XQ. 133. Did it ever occur to you to leave off the weights and use springs in your scale that you made in St. Louis with the automatically revolving drum?

A. No, sir; I should never have bothered about it at all, only with the idea of doing away with the spring altogether.

XQ. 134. Of what material was this fulcrum I made, referring to your pencil exhibit sketch of the scale you made in St. Louis?

A. That was made of a piece of steel bar, inch by $\frac{1}{8}$.

XQ. 135. Was it an old idea to use an air pump such as you have designated B?

A. Well, an air pump is an old contrivance for different things; it has been used before I was born.

XQ. 136. Well, in connection with scales?

A. The first air pump that was used in connection with scales was I think in vending machines—these penny in the slots, I think, that's where I got my idea.

XQ. 137. How many arms did the spiders at the ends of the drums have?

A. I don't think they had quite as many as are represented in the drawing—four, I think.

XQ. 138. How many spiders were there in all?

A. The first scale I made had two; and the next time I made it I had a double cylinder, which took four.

XQ. 139. Why did you have two gravity weights instead of just one?

A. It was more of an even balance for the construction of the scale when hanging up, and also had more resisting power than the one weight; instead of having all the weight confined to one weight, it was distributed along two.

XQ. 140. You stated that the single cylinder scale that you made first was not satisfactory on account of overbalancing; just what do you mean by overbalancing?

A. The pull was all from one end.

XQ. 141. What harm was there in that?

A. Well, it meant having an extra bearing of a lever running in underneath connecting the pull down at the other end.

XQ. 142. Is that what you mean by overbalancing?

A. Well, it had an inclination to pull the scale on a sort of angle.

XQ. 143. How tight did the plunger fit in the air pump B, referring to your sketch?

A. Just enough fit to allow a certain portion of air to escape gradual while the plunger was working in and out.

XQ. 144. How did you fasten the pinion on the shaft?

A. In that particular one it was a drive fit and small keyseat filed on the shaft, and a small flat key drove between the pinion and the shaft.

XQ. 145. How did you mark the penciled strip, by getting the mark for twenty pounds and then dividing it up into pounds?

A. Equal divisions between each pound.

XQ. 146. How many different charts did you prepare for this automatically revolving drum scale that you experimented on at St. Louis and Detroit?

A. I just penciled the one chart.

XQ. 147. Did you use the same chart when you had a single drum as when you use the double drum?

A. No, sir; when I made the single drum I didn't use the chart at all; I just used the figured spaced strip of paper.

XQ. 148. Was it first at Detroit that you tried the wooden disks?

A. I think Detroit was the time I tried the wooden disks, yes.

XQ. 149. Why was it you changed the position of the pivot head when you experimented at Detroit?

A. That was to get more or less leverage on my gravity weight.

XQ. 150. Could you use the same chart with the pivot in either position?

A. Decidedly so.

XQ. 151. Please explain why that was.

A. That would all depend on the left of the gravity weight, the resisting power.

XQ. 152. Are you sure that the scale with the pivot head turned the drum just the same angle for each added pound of weight on the pan?

A. Yes, sir; I am quite sure.

XQ. 153. When you used the wooden disks the radius was different for different weights, was it not?

A. I don't remember just exactly how that did work out.

XQ. 154. About how great a fraction of the chart was filled out with the prices in pencil, something like 10 or 20 per cent.?

A. I just could not say as to that how many there were.

XQ. 155. When you adjusted the weights on this scale was there any other adjustment than merely regulating the length of the arm or varying the weight on the arm?

A. No, sir.

XQ. 156. You used the same pivot head that is in evidence all the time, did you, except when you used the wooden disks?

A. Yes, they were the only ones made.

XQ. 157. You spoke of balancing the drum more perfectly when you experimented with the scale in Detroit. Just how did you do this?

A. I rigged up two parallels distanced between to take in the drum that were perfectly level, then I balanced the drum right on these parallels.

XQ. 158. Of what material was the shaft of the revolving drum in the St. Louis scale?

A. It was made out of a piece of three-sixteenths drill rod.

XQ. 159. Did you have any difficulty in making the drum read evenly all the way around, that is, making equal angles for equal additions of weight?

A. I don't remember experiencing any trouble in regard to that.

XQ. 160. About what angle did the weight swing to from its position at no load to its position at a load of 20 pounds?

A. I never measured the exact angle of those when they were throwed out. I presume that they were over 45, anyway.

XQ. 161. You mean 45 degrees?

A. Yes.

Redirect Examination by Mr. Macauley.

RDQ. 162. Did you test out the scale with the metal pivot heads before you left St. Louis?

A. Yes, sir.

RDQ. 163. Did you test it with the wooden disks before you left St. Louis?

A. No, I think the disks were made when I came to Detroit.

RDQ. 164. Then the tests which you have mentioned as made at St. Louis were all with metal pivot heads, were they?

A. As near as I can remember, that is the fact.

Recross Examination by Mr. Richmond.

RXQ. 165. Did you lay out those metal pivot heads at first in any particular way with the idea that you were going to get the drum to turn equal angles for equal additions of load?

A. There was no particular thought as to that respect at the first go-off, but in the test it seemed to do the work as I have stated before, within the fraction of an ounce.

RXQ. 166. When there was no load on the pan, about how far off from vertical did the weight hang?

A. Well, that was one of my studies when I made this drawing, and I figured that the angle represented is about right when the scale was at balance, zero. You see it's drawed from the line a little way on account of the balancing the platform which I think is a good deal better than having it perpendicular.

JOHN H. MILBURN.

Certificate waived.

IN THE UNITED STATES CIRCUIT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company
vs.
Toledo Computing Scale Company.
} In Equity. No. 30,024.

Introduction of proof resumed on behalf of defendant in the above-entitled cause, pursuant to the annexed notice, before Charles G. Brevillier, Esq., a Notary Public, at the residence of Frank W. Bacon, 438 West Sixth street, Erie, Pennsylvania, beginning at 3 o'clock, February 7, 1912.

Present:

Carl. A. Richmond for complainant;

John B. Macauley for defendant.

FRANK W. BACON, a witness called by defendant, having first been duly sworn, testifies as follows:

Q. 1. Will you please state the name, age, residence and occupation?

A. Frank W. Bacon; age, 48 years; president of the Erie Tool Works; residence, Erie, Penna.

Q. 2. Were you acquainted with Edward W. Wise at any time?

A. Yes; I knew him well during the time that we were manufacturing computing scales under his patent in 1897 or 1898.

Q. 3. What was the character of this scale that you were manufacturing under his patent?

A. It was a computing scale with a cylinder carrying a table of computations; the cylinder was revolved by the extension of the poise on the scale beam. This poise was threaded and controlled the spiral rod. At the end of the spiral rod a small gear wheel meshed with a larger gear wheel which was pinned to the shaft of the cylinder, the two working in conjunction.

Q. 4. Was the scale of which you speak a platform or a hanging scale?

A. It was a scoop scale, such as commonly used by grocers on the counter.

Q. 5. Was this scale made by the Erie Works?

A. No, sir; by the Reed Company.

Q. 6. Can you recall the number of the patent under which you were working?

A. No.

Q. 7. From what did you take your design for the scale that you made?

A. We copied with few changes one of the models that Wise had with him.

Q. 8. How many models had he

A. Two.

Q. 9. Were they full-sized working models?

A. Yes, both of them.

Q. 10. Will you please describe as nearly as you can the cylinder of the scale from which you made your commercial scale?

A. The complete cylinder of the scale which Wise brought here and which we copied with but few changes consisted of an outer shell across the front of which was a plate carrying a glass, making a slot in the cylinder perhaps ⅜ of an inch wide or I think this was wider, and inside of this cylinder or cover or shell there was a cylinder revolving that carried a table of computations. This inner cylinder was revolved by the extension or by the withdrawal of the poise on the scale and in revolving exposed certain figures through the glass front or slot, and these figures presumably showed the cost price of the article being weighed at the point at which the price per pound showed in the slot or frame covered with glass. In this glass frame, as I remember, there was shown the price per pound of, I think, from four cents to twenty-five cents by pennies, and I think from there to one dollar to five. Of this, however, I am not at all certain.

Q. 11. Of what materials was the cylinder composed?

A. In the model scale the ends were of either brass or cast iron; in the model that Wise brought here the cylinder was of cardboard or heavy paper and we attempted to make them of cardboard. We afterwards made them of rolled brass or copper and covered them with cardboard which was sized in a manner that would permit our glueing on the table of computation.

Q. 12. Will you please now describe the other model which Mr. Wise had? I refer to the scale with the column.

A. It is what we would call a small platform scale. I remember of its having a platform about 12 or 14 inches wide and, perhaps, 16 long. It had two upright columns standing perhaps 12 or 14 inches high. Across the head of the columns a cap plate and the mechanism over this practically the same as on the other scale.

Q. 13. Of what material was the cylinder composed in this platform scale?

A. They were both of paper or cardboard. That was Wise's idea, of rolling a long sheet of paper around a cylinder and keeping it gummed at all points until he had made a complete cylinder of sufficient strength to carry this table of computations and be entirely smooth and perfect in shape.

Q. 14. Upon what was the cylinder mounted in the platform scale?

A. It was mounted at the head of the left-hand column on a bracket of brass or iron. They used a pivot iron.

Q. 15. Did you see this platform scale frequently or for any length of time?

A. I believe we had that scale in our possession for several months.

Q. 16. What became of it afterwards?

A. I never knew. Ruhl said it was packed up and turned over to Wise.

Q. 17. I show you a photograph which is marked "Defendant's Exhibit Wise Photograph," and ask you to state how it compares with the model platform scale.

A. I think beyond question it is the scale he brought to us.

Q. 18. You are reasonably certain of this, are you?

A. I am.

Q. 19. Did he bring any other scales than those you have mentioned?

A. Not to my knowledge.

Direct examination closed.

XQ. 20. Please give as nearly as you can the date when you first saw these two models of Mr. Wise.

A. I should say 1897 or 1898. I can get the exact dates as to that by referring to the books of the Reed Manufacturing Company.

XQ. 21. Did you manufacture many of these scales of the type having the scoop?

A. We made I should say a couple of hundred ourself

and afterward had I should think a thousand or more made by John R. Keim of Buffalo.

By Mr. Macauley: The above question is objected to as immaterial and irrelative.

XQ. 22. And did all of these scales numbering something like 1200, have a drum connected by gearing to the poise in the manner you have described?

A. Yes, sir.

XQ. 23. Of what material were the rotating drums in these scales that you manufactured?

A. Those that we made were of either sheet brass or copper. It is possible that Keim may have used light sheet steel. Of this I am not certain.

XQ. 24. Did you make any commercial scales and sell them having paper or cardboard drums?

A. I think it quite likely that the first lot of scales sold were with the paper or cardboard drum, probably not to exceed fifty. We had trouble. Under different conditions of heat they warped and got out of shape and we gave it up.

XQ. 25. When you made the drums of paper or cardboard did you have several thicknesses?

A. We had those drums made for us by some printing office here in the city and the work was done under Wise's direction. My understanding of it was in taking a long sheet of a good grade of white paper the width of the length of the drum. This was gummed so that it would adhere as it was rolled and rolled over a cylinder until this one sheet had gained several thicknesses, then dried and removed from the cylinder. He kept rolling and rolling until he had gained a sufficient thickness to get the required strength and it was then allowed to dry on the cylinder and when dried taken off.

XQ. 26. Did you ever make or have made any scales like the "Defendant's Exhibit Wise Photograph" which has just been shown to you?

A. No, sir; we were never interested in that model outside of the mechanism carrying the scale beam and table of computation, or the overhead mechanism.

XQ. 27. In what were you interested in the overhead mechanism?

A. Only in its similarity to the mechanism we were using on the other scale.

XQ. 28. How did the diameter of the drum on your com-

mercial scale compare with the diameter of the drum on Wise's platform scale?

A. I should say that in proportion to the length about one-third less in diameter.

XQ. 29. Please state as nearly as you can recall what were these respective diameters in inches?

A. I think that our drum was about 4 inches or a little less in diameter and Wise's about 6.

XQ. 30. And what were the lengths in inches of the two diameters?

A. Twelve inches or a bit more.

XQ. 31. In the scales that you manufactured did you make any particular effort to have the drums extremely light in weight?

Mr. Macauley: Objected to as immaterial and irrelative.

A. I know that Wise insisted that we must keep down the weight of the drum carrying the table of computations and of all parts above the scale beam and suppose that a scale man had a reason for this. In any case I know that there was a marked effort made to keep down the weight because we considered aluminum before we used brass or copper.

XQ. 32. Please give the full name and residence of this party by the name of Ruhl that you have mentioned.

A. Ruhl was our tool-maker at that time; he was second in charge and knew more than any one now living. Name, John P. Ruhl; residence, 410 West 9th street, Erie, Pa.

XQ. 33. Have you any of those scales in your possession now such as you or Keim manufactured?

A. I have not. I have not been with the Reed people for ten years.

XQ. 34. What was the exact title of this "Reed Company," and was it a partnership or a corporation?

A. I think at the time that we began building the Wise scale we were a co-partnership and that we shortly after incorporated. I cannot tell you definitely; I can ascertain that definitely. We operated several years as a co-partnership.

XQ. 35. Is the concern still in existence and doing business?

A. It is as a corporation.

XQ. 36. Manufacturing scales?

A. I think not.

XQ. 37. Please state briefly and in a general way what its output is at the present time.

A. The Reed Manufacturing Company are now making a line of plumbers', steam-fitters' and engineers' tools, pipe vises, pipe cutters, stocks and dies, bench vises, wrenches, and similar tools.

XQ. 38. Are they doing business as at the time you were with them in the scale business?

A. We started the scale business at our old shop on the corner of Sixth and Myrtle streets and the business was transferred to the present plant on West Eighth street and the E & P tracks during the time we were making scales.

XQ. 39. And do they still continue in business at this last-mentioned place?

A. Yes.

XQ. 40. Why did you not undertake the manufacture of scales like Wise's model of the platform scale?

A. We thought the demand for the other type of scale would be very much greater, and realized that we would have all we could handle if we financed the one proposition.

XQ. 41. What became of Wise?

A. They say he is dead.

XQ. 42. Was he with you during the entire time that you manufactured the scales such as you have described?

A. No, sir.

XQ. 43. About when did he leave you?

A. I don't think Wise remained here over six or eight months.

XQ. 44. Where did he go then?

A. I never knew definitely but had information that he had gone to California. I think we had some correspondence with him at later dates that showed that he had gone there?

XQ. 45. When he left you he took the platform scale with him, did he?

A. I am very certain that he took it with him. It was never our property.

XQ. 46. Did you acquire any patent rights from Wise for the scale that you manufactured?

A. I have tried since this matter came up to remember the details of our agreement with Wise and I simply cannot remember what the proposition was. We, of course, had some rights or we could not have gone to the expense we

did. The books of the Reed Manufacturing Company would, of course, show what Wise was paid. I cannot remember.

XQ. 47. I direct your attention to a printed Patent Office copy of patent No. 532,129, granted January 8, 1895, to E. W. Wise, and ask you whether it is at all familiar to you in this connection?

A. In its essential parts it is the scale that we were making.

XQ. 48. In describing how the paper or cardboard drums were made you mentioned that a long sheet of paper was wound around and round; was the chart on an additional sheet pasted over this?

A. Yes, the charts were printed on an entirely separate sheet.

XQ. 49. Just what was it that caused the drum to rotate in these Wise scales; that is, was it done by hand, and if so, in what manner?

A. There were two ways of rotating the drum, the extending of the poise through which a spiral rod passed on the end of which rod was pinned a small gear wheel which in turn revolves a large gear wheel pinned to an axle to which the drum carrying the computations was attached revolved the said drum. There was also at the outer end of the cylinder a small hand wheel which was pinned to the axle of the drum and revolving this revolved the drum and simultaneously advanced or retarded the poise on the scale.

XQ. 50. In any case the drum was rotated by hand more or less directly, was it not? That is, by the hand moving the poise or by the hand rotating the hand wheel at the end of the drum?

A. There is no other means by which it could be rotated.

XQ. 51. Merely placing the article to be weighed in the scoop or on the platform of the scale had no effect to rotate the drum, did it?

A. It could only be possible in a spring scale.

XQ. 52. In what respects was the overhead mechanism of the Wise platform scale model different from the mechanism of the scale you were manufacturing?

A. I think in its essential features it was the same. As I have already stated, as I remember it was somewhat larger but the results obtained were the same.

XQ. 53. Did this Reed Company manufacture other lines at the time they were making the scales that you have discussed?

A. Yes, sir.

XQ. 54. Why did this Reed Company stop manufacturing the Wise scale?

A. The Reed Manufacturing Company had a contract with a selling company called the Erie Automatic Computing Scale Company that was incorporated for the purpose of selling the Wise computing scale. They failed in their contract for purchases and the Reed Manufacturing Company dropped the scale business, giving preference to their other lines.

Cross-examination closed.

No redirect examination.

Adjourned to Beaver Falls, Pennsylvania.

Certificate waived.

IN THE UNITED STATES CIRCUIT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company
vs.
Toledo Computing Scale Company. } In Equity. No. 30,024.

Introduction of proof resumed on behalf of defendant in the above-entitled cause, pursuant to the foregoing notice and adjournment, before Lola M. Criss, a Notary Public in and for the County of Beaver and State of Pennsylvania, at the Providence Hospital, Beaver Falls, Pennsylvania, beginning at 5 o'clock, February 8, 1912.

Present:

Carl A. Richmond, for complainant;

John B. Macauley, for defendant.

WILLIS L. DAVIS, a witness called by defendant, being first duly sworn and cautioned, testifies as follows:

Q. 1. Please state your name, age, residence and occupation.

A. Willis L. Davis; age, 37; occupation, grocer; residence, Beaver Falls, Pa.

Q. 2. How long have you been engaged in the grocer business?

A. About twenty-two years.

Q. 3. Where have you been so occupied during this period?

A. At No. 337 7th Avenue, Beaver Falls, Pa.

Q. 4. Who is the proprietor of this store?

A. Myself.

Q. 5. How long have you owned this store?

A. Since 1894.

Q. 6. Who owned it before you did?

A. Joe Laird.

Q. 6a. And you worked for him previously, did you?

A. Yes.

Q. 7. What kind of a scale did you have in the store when Mr. Laird owned it?

A. We had several scales there?

Q. 8. State briefly the different kinds of scales.

A. We had platform Fairbank scale, and even balanced scale, and also a small computing scale.

Q. 9. State as nearly as you can when you first had the computing scale.

A. About 1892.

Q. 10. How did you fix this date.

A. I started in business in 1894, and the scale was in use for quite a while before.

Q. 11. Do you know where Mr. Laird obtained the scale?

A. He got the scale from Mr. Culmer.

Q. 12. Do you know Mr. Culmer's initials or where his business was located?

A. His first name was John, and he was located about three doors from the store.

Q. 13. Describe this scale as nearly as you can.

A. As near as I can remember it was a small cylinder about as large as a French pea can, and may be a little larger, the spring set the price by turning the bottom of the scale, the price appearing at the top of the scale, the cost was indicated on the front.

Q. 14. Of what was the scale composed?

A. The outside of the scale was nickel.

Q. 15. What part of the scale did you turn?

A. The bottom.

Q. 16. Upon what was the price written?

A. It was written upon a cylinder in the inside of the other cylinder.

Q. 17. Of what material was the inner cylinder?

A. What you could see of it was some fine finished paper.

Q. 18. What was the shape of the opening through which you saw the number on the inner cylinder?

A. I am not positive about that, but I rather think it was round.

Q. 19. Was this a hanging scale or a counter scale?

A. I remember it was a hanging scale.

Q. 20. Was there any connection between the bottom that you turned and the inside cylinder?

A. There was.

Q. 21. Did they turn together?

A. Yes.

Q. 22. Do you know what became of this scale?

A. I do not.

Q. 23. During the time that you had it in the store did you use it frequently?

A. Yes, we did.

Q. 24. Did it work all right?

A. Yes, it worked all right.

Q. 25. Do you know where Mr. Laird resides at present?

A. At East Liverpool, Ohio.

Q. 26. I show you a drawing marked Defendant's Exhibit Culmer Sketch. Please say how it compares with the scale that you had.

A. It looks like the same scale.

Q. 28. Do you notice any difference between it and the scale you had in the store?

A. I notice no difference.

Direct examination closed.

Cross-Examination by Mr. Richmond.

XQ. 29. What do you mean by an even balance scale?

A. A scale without springs and use weights.

XQ. 30. How many scales like this one you have just been describing have you ever seen.

A. I saw quite a few of them in Mr. Culmer's office.

XQ. 31. How many did you ever see in use?

A. I don't remember of ever seeing any in use.

XQ. 32. Did you ever see a scale in which the drum was rotated automatically, by the load being weighed? I mean

the scale with the computation drum, in which placing the article to be weighed on the pan or scoop caused the drum to rotate

A. No.

XQ. 33. Placing the article to be weighed on the pan of the Culmer scale did not cause rotation of its drum, did it?

A. Not automatically.

XQ. 34. But its drum rotated only by hand, did it?

A. Yes.

XQ. 35. Do you know what was inside of the "fine finished paper" that you mentioned in answer to Q. 17?

A. No, I don't.

XQ. 36. What was the last that you remember of this scale?

A. I think a man named Bryer that bought Mr. Laird's stock also bought the scale.

XQ. 37. Did you buy Laird out?

A. No.

XQ. 38. When was it Laird sold his stock to Bryer?

A. In 1894.

XQ. 39. What is the full name of this party Bryer, and where does he live?

A. His name is Andy Bryer, and I don't know where he lives now.

XQ. 40. When he bought Laird's stock did he move it out of the store?

A. He was sold out shortly afterwards.

XQ. 41. About what was the heaviest article that you could weigh in this scale that you have just described?

A. I can't say, positively; five or ten pounds.

Cross-examination closed.

WILLIS L. DAVIS.

Certificate waived.

Adjourned to the office of Owen & Owen, Nicholas Building, Toledo, Ohio, at ten o'clock A. M., Feb. 9th, 1912.

LOLA M. CRISS,
Notary Public.

Commission expires Jan. 26, 1913.

Further taking of testimony on behalf of the defendant resumed, pursuant to adjournment, before Solon T. Klotz, Notary Public, at Room 921 Nicholas Building, Toledo, Ohio, on Friday, February 9, 1912, at 12 o'clock M.

Appearances:

Carl A. Richmond, Esq., for complainant;

John B. Macauley, Esq., for defendant.

JOHN D. BURKHOLDER, a witness called on behalf of the defendant, having been cautioned and affirmed, in response to interrogatories, deposes as follows:

By Mr. Macauley:

Q. 1. Please state your name, age, residence and occupation.

A. John D. Burkholder; age, 38; residence, River Road, Maumee, Ohio; I have charge of the patent department of the Toledo Computing Scale Company.

Q. 2. How long have you been connected with the Toledo Computing Scale Company in your present capacity?

A. Since about the 23rd of July of 1911.

Q. 3. What, if any, has been your connection with the present suit of The Computing Scale Company against the Toledo Computing Scale Company?

A. I have been investigating in different parts of the country, trying to locate evidence concerning the prior art and concerning the manufacture of cylinder scales and development of the said line of scales.

Q. 4. What prior scales have you been investigating?

A. The cylinder scale that was manufactured by the Dayton Computing Scale Company, known as the Kepler scale, is one, and another that was made by a Mr. Wise, according to his own patent. Another that was made by Mr. Milburn, of Detroit. Another that was made by Mr. Culmer, of Cleveland, Ohio.

Q. 5. Will you briefly describe the course and result of your investigations into the history of the Wise scales?

A. We were very anxious to locate the facts in the case, and I went to Los Angeles, Cal., to see Mrs. Margaret Wise, the widow of Mr. Wise, the inventor, who is now dead. She remembered different models that were made, but at the time that I interviewed her she could not recall what had become

of the first models that were made. I called to see several of the stockholders of the Wise Computing Scale Company, who live in Los Angeles, Cal., one of whom remembered that there was a model made in New York City but could not give me the date it was made, neither could he tell me what had become of the model. I went to New York to locate, if possible, the model maker, which I did, who was William Gardam & Sons. Their records showed that a model had been made by them in 1894. From this model Mr. Netter, a draftsman, made the Patent Office drawing for the British patent applied for early in the year of 1895. I was able to locate the man who worked on the model; his name was Gardam. He remembered the details of construction. And I also located the party, Mr. Frank Bacon, who lives at Erie, Pa., that recalled having seen this model, but was unable to tell me what had become of it. In order to be sure whether the model was destroyed or not I telegraphed Mrs. Wise, at Los Angeles, Cal., telling her that I had located four parties who saw the model shown in the British patent, asking her if the model was ever shipped from Erie, Pa., or if it was destroyed. To this she replied that one British patent and scale model was sold to an Englishman, and probably this was the model we desired. She said her attorneys were trying to locate the Englishman; that he might have the model. I telegraphed her then, asking her about how long it had been since the patent and model were sold to the Englishman, to which she replied "about thirteen years ago."

Mr. Richmond: Objected to as secondary.

Q. 6. Have you been able to get any other information concerning the probable whereabouts of this scale concerning which you have just testified?

A. I have not.

Mr. Richmond: Same objection.

Q. 7. I hand you a copy of a British patent, marked "Defendant's Exhibit Wise British Patent 678 of 1895," and ask you to state whether this is the British patent referred to in your answer?

A. It is.

Q. 8. I hand you copies of four telegrams, dated, respectively, February 3, February 4, February 5, and one in pencil, also February 5, 1912, and ask you to state what they are?

A. These are the telegrams referred to when communi-

cating with Mrs. Wise at Los Angeles and her replies to my telegrams.

Mr. Macauley: The telegrams referred to by the witness are offered in evidence, with the request that they be marked, collectively, "Defendant's Exhibit Telegrams to and from Mrs. Wise."

Mr. Richmond: Objected to as irrelevant, immaterial and incompetent, and as not properly proved themselves, and not constituting the proper proof of the transactions to which they relate.

Q. 9. Please state briefly whom you saw in reference to the Culmer scale.

A. I saw a Mr. Davis, in Beaver Falls, who remembered having used one of the Culmer scales, but could not tell me what had become of the scales. I saw Mr. Culmer, himself, who invented the scale.

Mr. Richmond: Objected to as secondary.

Q. 10. Did you make any effort to find other witnesses as to this Culmer scale which Mr. Davis told you about?

A. Yes. I went to Chicopee Falls, Mass., to see the parties who had bought Mr. Culmer out, thinking they might have some of the old scales on hand but they did not have any of the first make. They told me the oldest scales they destroyed.

Mr. Richmond: Same objection.

Q. 11. Did you make any effort to find Mr. Laird?

A. I have not. He is located somewhere in Ohio, but I did not see him.

Q. 12. Were you able to learn of any other of these early Culmer scales having a paper cylinder which are still in existence?

A. I was unable to locate the users of the scale except the party mentioned.

Q. 13. The Culmer scale to which your testimony relates is that shown in Defendant's Exhibit Culmer Sketch, which I now hand you, is it?

Mr. Richmond: Objected to as leading.

A. This is the Culmer scale that I was looking after.

Q. 14. Name the witnesses whom you have endeavored to locate or succeeded in locating concerning the Milburn scale.

A. Mr. John Milburn, who invented the scale, and his son, Charles, who lives in Dayton, Ohio, are the only two parties that I was able to locate.

Q. 15. Did you ask Charles about his knowledge concerning the hanging scale made by his father in St. Louis?

A. Since the testimony of his father I have not communicated with Charles on this subject.

Direct examination closed.

Cross-Examination by Mr. Richmond.

XQ. 1. How were you employed prior to July 23, 1911?

A. Since February, 1911, I have been on the inventive staff of the Toledo Computing Scale Company.

XQ. 2. And what were you doing just prior to February, 1911?

A. I was practicing osteopathy in Lancaster, Pa., and was also connected with the National Scales Corporation of Lancaster, Pa.

XQ. 3. Connected in what way?

A. I was the president of the company.

XQ. 4. When did you commerce your search for material or evidence in connection with this suit?

A. I think it was in November, 1911.

XQ. 5. About what portion of your time has been given to that matter since then?

A. I spent one week in Dayton, Ohio, from the 2nd of January to the 5th of January, 1912, a trip to the Pacific Coast, a week's trip to New York, Massachusetts and Connecticut, two days to Erie, Pa.

XQ. 6. Did you visit any other places than those you have just mentioned in this connection?

A. I was at Detroit.

XQ. 7. Any other places?

A. None that I recall.

XQ. 8. On any of these trips that you have just mentioned did you stop for any length of time at other places than you mentioned, and if so, please name such other places where you stopped to pursue your investigations or inquiries in this connection?

A. On my trip to Dayton, Ohio, first referred to, I stopped at Cleveland both going and coming to Toledo. On my trip to the Pacific Coast I stopped at Chicago; Los Angeles; San Francisco; Oakland, Cal.; San Jose, Cal.; Kansas City on my return, Chicago, and Toledo. On my trip to New York, Massachusetts and Connecticut referred to, I stopped at New Britain, Conn.; New Haven, Conn., and at Beaver Falls, Pa.

XQ. 9. You have now mentioned all the trips that you have taken in this connection and all the places that you visited in the same connection on these trips, have you?

A. Generally speaking, I have. Of course, there were minor trips made from some of the points mentioned.

XQ. 10. But aside from minor trips from some of the points mentioned you have mentioned all the places where you went seeking information along this line, have you?

A. Yes, sir. The rest of my investigation was by letter and telegrams.

XQ. 11. Have you given practically all of your time and attention to this investigation that we are discussing, since November, 1911?

A. With about one week solid time given at Dayton, as I have said, the thirteen days spent on the trip to the Pacific Coast, time of travel included, was given to this investigation, about one week's time in the trip to New York, Massachusetts and Connecticut and return by way of Beaver Falls was given to this investigation, and two or three days' trip to Erie, Pa., and Detroit, is all the exclusive time that was given to this investigation. The other time put on this was in connection with other duties in the patent department.

XQ. 12. What other scales did you investigate in this connection aside from the four that you have mentioned in your answer to Q. 4, namely, the Kepler, Wise, Milburn and Culmer scales?

A. There was only two others that I recall. One was the Babcock scales. I think the inventor's name was C. M. Babcock, who invented a cylinder computing scale, as shown in patent issued about 1890. I was unable to locate Mr. Babcock or any of his scales. The Acme cylinder scale was another; that has a metal chart instead of paper, the mechanical construction of which is very similar to the cylinder scales in use at the present day.

XQ. 13. I show you a printed United States Patent Office copy of patent No. 421,805, granted February 18, 1890, to C. M. Babcock, and ask you if this is the patent referred to by you in the foregoing answer?

A. It is.

XQ. 14. Did all six of these scales that you investigated have drums with prices inscribed thereon?

A. I cannot say as to the Babcock, except as shown in the patent, but all the others had.

XQ. 15. Please tell briefly about this Acme scale that you have mentioned?

Mr. Macauley: Objected to as immaterial and irrelevant.

A. The Acme scale was manufactured and sold as early as 1891, manufactured somewhere in New York State, and had a computing cylinder on the beam.

XQ. 16. How did it differ from the Wise scale with respect to the location and actuation of the computing cylinder?

A. The location of the cylinder was similar on both insofar that they were placed closely to the beam graduated in pounds and ounces, on which there was a sliding poise to balance the scale according to the weight on the platform. However, the poise was touched and moved by hand on the Acme scale, but differently operated on the Wise scale. By pushing the poise on the Wise scale the chart would revolve at the time the poise was moved. Or, if the cylinder was turned, the poise would move out on the beam. The mechanical construction of the charts being about the same, except one, the Acme was made exclusively of metal.

Recess to 2:30 P. M.

2:30 P. M.

Met pursuant to adjournment. Present as before.

XQ. 16a. In the Acme scale were the cylinder and the poise adjustable independently of each other?

A. They were.

XQ. 17. How was the cylinder adjusted in that scale?

A. Hand operation.

XQ. 18. Was there a hand wheel at the end of the drum or something of that sort?

A. I think so.

XQ. 19. What have been your sources of information on this Acme scale?

A. I saw a second-hand dealer in Dayton, Ohio; I am not sure as to his name; I think it was Morris; I am not sure about the name; said that he had sold the Acme scale as early in 1891 or 1892.

XQ. 20. Did you ever see one of them?

A. Yes, sir.

XQ. 21. Where and when?

A. I saw one of them at the second-hand dealer's place just spoken of, and one of them at our factory.

XQ. 22. Have you learned about them from any other sources than those you have just mentioned?

A. I saw an option that was given by a company that manufactured them to some Dayton parties for the sale of their plant, which was given, I think, in 1891. Mr. John Milburn told me that he made some of the first Acme cylinder scales.

XQ. 23. Have you now mentioned all the sources of your information about the Acme scale, and if not, please mention all the remaining sources?

A. All except that I understood that these scales were made according to a patent issued about 1889.

XQ. 24. Do you know any other data in regard to this patent by which it might be more definitely identified?

A. I have it in my note book the name of the patent, but do not recall it from memory.

XQ. 25. Is your note book at hand?

A. It is at the office.

XQ. 26. Do you know any more about that Babcock scale than the information that may be obtained from the patent we have just referred to in connection with it?

A. Not from personal investigation.

XQ. 27. Do you know whether scales were ever manufactured or sold pretending to conform to this patent?

A. I understood there was a model made, but as to whether they were marketed and sold I couldn't give you any information.

XQ. 28. Did you make any investigation to find out what had been done along the line of the United States patent to Phinney, 106,869, dated August 30, 1870, a copy of which I now show you?

Mr. Macauley: Objected to as improper cross-examination.

A. Mr. Culmer mentioned this patent to me, but I didn't investigate it further.

XQ. 29. In no one of these four scales that you did investigate as mentioned by you in answer to Q. 4, was the cylinder actuated automatically by merely placing the article to be weighed upon the pan or scoop of the scale; this is correct, is it not?

A. That is correct.

XQ. 30. Who are the four parties mentioned in the telegram dated February 3, 1912, to Mrs. Wise, from whom have you testimony as having seen the Wise scale model?

A. Joseph W. A. Gardam, who made the model; Ralph Netter, who made the drawings for the British patent application; and the lady bookkeeper at William Gardam & Sons, who presented the books showing when the model was made; I think her name was Mrs. Coultgreve; I am not so sure as to her name; we have her testimony on record; and Frank Bacon, who was willing to testify at the time this telegram was written, and whose testimony we now have.

XQ. 31. What is the name of the concern at Chicopee Falls, Mass., that you went to see?

A. As near as I recall I think it is the National Scales Company.

XQ. 32. Why did they destroy the Culmer scales?

A. They purchased a number of the Culmer scales made at various periods of development; there being no market for them, they selected all those that were not in good order or that they thought they could not dispose of, and destroyed them and kept only the newest and best preserved scales.

XQ. 33. What kind of a scale do you understand is meant by an automatic computing scale?

A. At the present day we consider an automatic scale a scale that weighs and computes entirely automatically.

XQ. 34. That is, you put on the article to be weighed and the scale does the rest?

A. Yes, sir.

Mr. Macauley: Cross-questions 33 and 34 are objected to as improper cross-examination, and it is agreed that this objection shall apply to all questions along the same line.

XQ. 35. Have you ever seen one of the Culmer scales?

A. I saw one of the last that was made of that type, so claimed.

XQ. 36. You mean the type having the drum with its axis vertical?

A. Yes, sir.

XQ. 37. When was it made, and where did you see it?

A. According to Mr. Culmer's statement it was made after 1893, or during the year '93. I saw it at Chicopee Falls, Mass.

XQ. 38. Where is it now?

A. I purchased one and had it sent to the Toledo Computing Scale Company, and I understand it is there, but I have not seen it since.

XQ. 39. One of the four scales that you investigated, as

stated in your answer to Q. 4, was "that made by Mr. Milburn of Detroit." Where was this scale made?

A. Mr. Milburn said it was made in St. Louis, Mo.

XQ. 40. Did you ever see one of these scales?

A. No, sir; I saw a photograph of it.

XQ. 41. Were your stops at Los Angeles, San Francisco, Oakland, San Jose and Kansas City all in connection with and on account of the Wise scale?

A. No, sir; only at Los Angeles.

XQ. 4. Were you looking up material or evidence in connection with this suit at the other stops mentioned?

A. That is true for Oakland, California, San Jose and San Francisco. Not for Kansas City.

XQ. 43. Please state for each one of those three places which of the six scales you were investigating.

A. I learned of the use of one of the Kepler type scales, which scale I saw at Oakland; the other two points of investigation was to establish when the scale was made, by whom sold and by whom purchased. The purchaser is dead, so reported, as well as the party who sold it. I could therefore not learn the exact time of sale.

XQ. 44. Did your stop at Kansas City have to do with collecting evidence for this case?

A. No, as stated above.

XQ. 45. What was the earliest commercially successful automatic computing scale of which you learned in your investigation?

A. I didn't learn anything in my investigation concerning the earliest successful automatic computing scale.

XQ. 46. What is the earliest one of which you have knowledge?

By Mr. Macauley: Objected to as improper cross-examination.

A. The only personal knowledge I have of this question comes through hearsay, one of which was the Boston butcher's scale.

XQ. 47. When did you first become interested in or connected with the scale business?

A. About four or five years ago.

Cross-examination closed.

Redirect Examination by Mr. Macauley.

RDQ. 48. In answer to XQ. 40 you say that you saw a photograph of the scale made by Mr. Milburn in St. Louis, Mo. Can you produce this photograph?

A. I here produce it.

By Mr. Macauley: The photograph is offered in evidence with the request that it be marked for identification "Defendant's Exhibit Photograph of Milburn Scale."

By Mr. Richmond: Objected to as irrelevant and immaterial, and entirely incompetent, and not properly proved.

RDQ. 49. Where did you get this photograph?

A. We had Mr. Charles Milburn, the son of the inventor John Milburn, who made the scale, to search for one of the said Milburn scales, and when calling on an old friend of the family he told them of his search for the scale. This family happened to have a photograph of the scale, which he gave to Mr. Milburn, who in turn mailed it to me, or to Mr. Davis in my care. This photograph was given to this family in Dayton, Ohio, while Mr. Milburn was visiting them (from St. Louis).

By Mr. Richmond: The foregoing answer is objected to because of its obviously hearsay and secondary character.

Redirect examination closed.

Deposition closed.

JOHN D. BURKHOLDER.

W. P. KISER, a witness produced on behalf of the defendant, having been duly cautioned and sworn, in response to interrogatories by Mr. Macauley, deposes as follows:

Q. 1. Please state your name, age, residence and occupation.

A. W. P. Kiser; age, 42; residence, Toledo; occupation, treasurer Toledo Computing Scale Co.

Q. 2. How long have you been connected with the Toledo Computing Scale Company?

A. About four years and a half.

Q. 3. What was your occupation preceding your connection with the Toledo Computing Scale Co.?

A. Secretary National Cash Register Co., Dayton, Ohio.

Q. 4. How long were you connected with the National Cash Register Co.?

A. About nineteen years.

Q. 5. What was the general nature of your duties during that period?

A. Started in as shipping clerk, then traffic manager, then traveling auditor, then district manager, and general auditor, then secretary of the company.

Q. 6. I call your attention to a cash register which is placed before you, and ask you to state what it is, and whether you have seen it before or not?

A. Union cash register; I saw it before about three weeks ago.

Q. 7. In what connection did you see it before?

A. I went to Dayton, Ohio, and found it in the basement of the National Cash Register Company's warehouse.

Q. 8. For what was this basement normally employed by the National Cash Register Co.?

A. Storage place for old cash registers taken in exchange for new National cash registers.

Q. 9. What, if any, changes have been made in it so far as you are able to observe since you got it from the National Cash Register Co.?

A. The paper that has been put on the indicating disks on some of the drums.

Q. 10. State, if you know, who made this change?

A. No, I do not. It was made in the Toledo Computing Scale factory, but by whom I don't know.

Q. 11. Then when you got it some of the drums were without paper strips, were they?

A. Yes, sir.

Q. 12. Is the machine in any other respects different from when you got it.

A. No.

Q. 13. Did you ever see machines of this character during your connection with the National Cash Register Company?

By Mr. Richmond: This question, and this line of questions, is objected to as irrelevant and immaterial to the issues in controversy.

A. Yes, sir.

Q. 14. State, as nearly as you can, when you first saw this kind of a cash register.

A. Well, I am not able to give a definite answer on that, the exact year; it is a good many years back.

Q. 15. When did you leave the National Cash Register Co.?

A. January 1st, 1917.

Q. 16. And it was a number of years before that, was it?

A. Yes, sir.

Q. 17. And these other registers that you saw at that time were substantially like the present register, were they?

A. Yes, sir.

Q. 18. Were you ever connected with the mechanical part of a cash register business?

A. No, sir.

Q. 19. Your connection was then entirely with the office force, was it?

A. Yes, sir.

Q. 20. Do you remember whether any of the registers seen by you at that time had front and back indication?

A. Yes, sir, they did.

Q. 21. Do you know whether the front and back windows were aligned or were offset?

By Mr. Richmond: The objection to this line of examination is repeated, and the particular question is objected to as leading.

A. I do not.

Q. 22. Are you familiar with the interior construction of this cash register, or of those of this make which you saw when with the National Company of Dayton?

A. I am not.

By Mr. Macauley: The cash register is offered in evidence, and it is requested that the notary mark it for identification "Defendant's Exhibit Union Cash Register."

By Mr. Richmond: The exhibit is objected to as irrelevant and immaterial to the issues of this controversy, and not properly established or proven, and not corresponding to any defense set up by the defendant in its answer.

Cross-Examination by Mr. Richmond.

XQ. 23. Do you know whether they make cash registers nowadays having this arrangement of indicating drums such as in the top part of this exhibit?

A. They make them with a drum, but the slips of paper are not pasted on. The drum is enameled and the figures are printed on.

XQ. 24. Do they have twice as many drums as there are

orders of digits? In explanation of my question, I call your attention to the fact that this exhibit has eight drums and four orders of digits to be recorded or indicated.

By Mr. Macauley: The question is objected to, the witness having testified that he was not familiar with the interior construction of machines of this character.

A. I do not know.

Cross-examination closed.

Deposition closed.

WILLIAM P. KISER.

O. C. REEVES, a witness produced on behalf of the defendant, having been duly cautioned and sworn, in response to interrogatories by Mr. Macauley, deposes as follows:

Q. 1. Please state your name, age, residence and occupation?

A. O. C. Reeves; 45 years of age; 2491 Lawrence Avenue, Toledo, Ohio; superintendent Toledo Computing Scale Co.

Q. 2. How long have you been connected with the Toledo Computing Scale Co.?

A. Six years last October.

Q. 3. What was your prior occupation?

A. Field superintendent for the United Shoe Machinery Co. on their big plant, Beverly, Mass.

Q. 4. State, as nearly as you can, the period of your employment with this Beverly Co.

A. Two years.

Q. 5. What was your occupation before you went to Beverly?

A. I was connected with the National Cash Register Co.

Q. 6. Please state as nearly as you can the date when you went to the National Cash Register Co. and when you left it.

A. I left there August of 1902, and I was there for fourteen years, June, 1888.

Q. 7. What was the nature of your duties during that period?

A. I had charge of their tool designing and supervising over a number of their departments.

Q. 8. Were you familiar at that time with the construction of computing machines?

A. I can say yes to the extent that I had charge of keeping all the old machines traded in.

Q. 9. Please state as nearly as you can the kinds of machines (that is to say, the makes of machines) received by you during that period?

A. Lamson, Kruse, Union, and several more.

Q. 10. You are familiar, are you, with the Union cash register?

A. I remember it particularly, owing to its construction being so different from any other at that time.

Q. 11. What is there about its construction that particularly struck you?

A. The compactness of the machine, the construction of the parts, which seemed to have been made by people familiar with watch or clock making, and it was a roller indicator machine, which was one of the first in that line. Most machines up to that time had been target indication or dial indication.

Q. 12. I call your attention to the cash register before you marked "Defendant's Exhibit Union Cash Register," and ask you if you know what it is?

A. I recognize that machine as that make.

Q. 13. When did you see this particular specimen of the machine last?

A. When I left the employ of that company in 1902 there were some of the machines on hand that had been received in previous years.

Q. 14. State as nearly as you can recollect when you first saw a cash register of this make?

A. I have no means of fixing the date. To the best of my knowledge it was several years before that time.

Q. 15. And you left in 1902?

A. Yes.

Q. 16. Will you please describe as well as you can the indicator part of the machines which you saw during your connection with the National Cash Register Company?

A. The indication as well as the recording or accounting mechanism was done by means of movement of a ladder keyboard. The power is transmitted by means of a segment on the end of this keyboard to a counting wheel and to an indicating wheel, which indicates on the front and by means of a small pinion driving off of the front indicator extending across the top of the machine and in turn drives the rear indication.

Q. 17. Then there were how many indicators, or sets of indicating wheels?

A. Well, there were four to the front and four to the back.

Q. 18. And how were the front indicators arranged with relation to the back indicators?

A. Well, I don't understand just what you mean, but it read dollars and cents in front correctly and indicated the same in the rear from left to right. Is that what you mean?

Q. 19. Are the front indicator wheels all arranged together and the back indicator wheels also arranged in a group together?

A. Separated.

Q. 20. What separates the wheels of the front group?

A. The back indicator wheels.

Q. 21. Then the front and back wheels are arranged alternately, are they?

A. Yes.

Q. 22. And the openings are correspondingly arranged?

A. Yes.

Q. 23. I show you a copy of patent marked "Defendant's Exhibit Fuller Patent 585,467," and ask you if you are familiar with the construction therein shown?

By Mr. Richmond: Objected to as irrelevant and immaterial to the issues, and as incompetent.

A. Yes, I am.

Q. 24. Please compare it with the construction of the cash register in evidence, and state whether you find any resemblance, and if so, what?

Objection repeated.

A. I find the ladder keyboard, indicating mechanism front and back counting wheels, releasing devices and locking devices, the same.

Q. 25. Will you please briefly describe how the cash register before you operates, using, if you desire, also the patent?

Objection repeated to this line of examination.

A. The ladder keyboard, which has numerals representing the amount desired to be indicated, is pressed to the desired amount and is stopped at the proper position by means of the position of the finger on the ladder keyboard; the power transmitted by this pressure in turn is transmitted by means of gears to a counting mechanism and also to an indicating mechanism for the front indicator, which is transmitted from the front indicator by means of gears to a back indicator. After this operation the cash drawer is opened

by means of a release key, and the ladders are returned to a normal position by means of a key releasing key.

Q. 26. I ask you to look carefully at the interior mechanism and note any material difference between what you see there and the structure shown in the patent.

A. As far as I can see it is exactly like the patent except probably in some minor detail which only a critical examination would show.

Q. 27. I will ask you if you find elements in the machine substantially corresponding to the following elements of the patent, viz.: The indicator wheel 9; the shafts 19, 20, 21 and the pinions thereon; the shutter 23; shaft 8; segments 6; ladders 4; segments 3; detents 57 and associated locking pawls; springs 29; springs 51; counting mechanism arranged as shown in the patent; springs 27; drawer and ladder release 33, 43?

By Mr. Richmond: Objected to as leading.

A. I do.

Q. 28. State whether or not, in general operation, the register is substantially identical with that shown in the patent.

Same objection.

A. Yes.

Q. 29. State whether the machine which you saw at the factory of the National Cash Register, when employed there, had a casing with openings in opposite sides but not opposite each other, the openings being covered with transparent material, and a rotary indicator of some kind arranged to show one set of indications through the openings on one side of the casing, and another set of indications through the openings on the other side of the casing.

By Mr. Richmond: Objected to as irrelevant, immaterial and incompetent.

A. The machines I saw there at the Cash Register Co. were identical with this exhibit machine to the best of my knowledge.

Q. 30. Can you state approximately how many machines like the Defendant's Exhibit Union Cash Register you saw before you left the National Cash Register Company?

A. Probably more than fifty machines.

By Mr. Macauley: The certified copy of the file-wrapper and contents in the matter of the letters patent of Frederick L. Fuller, No. 585,467, granted June 29th, 1897, is offered

in evidence, with the request that it be marked "Defendant's Exhibit Fuller File-Wrapper."

By Mr. Richmond: The foregoing exhibit is objected to as irrelevant and immaterial with respect to the issues involved in this controversy, and subject to any and all objections heretofore made with respect to the said Fuller patent, also as incompetent and secondary with respect to any alleged facts recited therein.

Direct examination closed.

Cross-Examination by Mr. Richmond.

XQ. 31. What is there about that machine that suggests to you it was made by people familiar with watch or clock making?

A. Why, it contains many punched sheet parts and drawn parts, and the gears are made in a manner that has the appearance of mechanics having worked on similar work in clock construction.

XQ. 32. How many countershafts are there in the machine carrying the little gear wheels so as to communicate rotation from the respective drums of one set to the drums of the other set?

A. There are four.

XQ. 33. Please describe how the two central drums are connected or geared together.

A. On ths machine they are geared by means of the shaft with the pinions on; the number of shaft in here depends on the number of banks in the machine, however.

XQ. 34. Then in the machine, if the particular countershafts which you have just referred to were removed those two central drums would not operate together, would they?

A. No.

XQ. 35. You don't find any single drum in that machine that carries two independent columns of figures on it, do you?

A. No.

XQ. 36. In other words, there are eight drums, each of which carries a single column of figures?

A. Yes.

XQ. 37. You don't find any two wheels or drums in there that are connected together so as to form a single cylinder, do you?

A. Not in this particular machine.

XQ. 38. Please look at the patent and state how many geared countershafts there are there.

A. They have three in this machine.

XQ. 39. You mean in the drawings shown in the patent do you not?

A. In the drawings shown in the patent, yes.

XQ. 40. Did you ever see a scale for weighing rigged up with the kind of apparatus that you find in the top of this Exhibit Cash Register?

A. You mean shafts to drive the mechanism? I have seen scales constructed that have a separate band for back indicating and a separate indication from the front, but I have never seen a scale where it was necessary to employ extra mechanism for producing that result owing to the friction involved.

XQ. 41. In other words, it would be impracticable on account of excessive friction to use such geared countershafts in an automatic computing scale, would it not?

A. I wouldn't consider anything mechanically impossible. I should consider such a device could be made possible.

XQ. 42. Well, the friction of the geared countershafts would be a pretty serious disadvantage, wouldn't it?

A. It would depend entirely on how it was constructed. Such as they are constructed in here it would be impossible.

XQ. 43. If those four geared countershafts in this exhibit cash register were removed, there would be no indication whatever on the back side, would there?

A. There would not in this machine, but it would be possible to produce a back indication on this machine without these countershafts, but the indication would be reversed; it would read from left to right instead of right to left, which is frequently done in cash register construction.

XQ. 44. No one of the drums opposite the side openings for the customer would work at all if these four countershafts were removed, would they?

A. No.

XQ. 45. So that on this exhibit cash register those four geared countershafts are absolutely essential in order to give the customer any indication of the amount registered, are they not?

A. Yes.

Cross-examination closed.

Redirect Examination by Mr. Macauley.

RDQ. 46. Will you please briefly describe the difference between the operation of the four countershafts in the exhibit machine and the three countershafts in the Fuller patent?

A. The necessity of installing an extra countershaft in this model, other than shown in the patent, is probably for some matter of design and to facilitate construction, as this shaft performs only the same feature as the pinion shown in the Fuller patent.

RDQ. 47. Do you regard the construction shown in the Fuller patent as operative?

By Mr. Richmond: Objected to as incompetent.

A. Yes.

RDQ. 48. Will you briefly describe the purpose of these countershafts in the Fuller patent?

A. The only purpose of these countershafts is to transmit the motion from the front indicators which read from left to right, transmitting this motion to the rear indication to make it read from left to right; merely for the convenience of customers.

Redirect examination closed.

No recross examination.

ORVILLE C. REEVES.

C. H. HAPGOOD, a witness recalled on behalf of the defendant, in response to interrogatories by Mr. Macauley, further deposes as follows:

Q. 1. Please look at the scale before you and state the character of the frame, beam, casings, and commodity receiver.

A. It is a scale with a base, base horn, having a housing mounted on the reverse end of the base from the base horn, and mounted on top of this housing is a casing into which is pivoted a computing drum; the lever in this scale is a lever of the second class, the fulcrum pivots of same being mounted in the base horn, and at a point slightly forward of the base horn, towards the housing, there is a goods receiving platform; on the end of the lever which projects into the housing is the power pivot which is connected to a pendulum mechanism, which is the resistance of the scale to counterpart any commodity placed upon the weighing platform.

Q. 2. What company is the maker of the base, casing, lever and so on of this scale?

A. Toledo Computing Scale Company.

Q. 3. Is this one of their stock scales in the respects I have mentioned?

A. In every respect except the computing drum.

Q. 4. Who assembled this computing drum with this scale?

A. One of the men in our experimental department, under my supervisionu.

Q. 5. Where was the computing drum obtained?

A. It was taken from a scale manufactured by the Dayton Company known as their No. 8 scale, or Kepler type of scale.

Q. 6. By the Kepler scale do you mean a scale similar to the "Defendant's Exhibit Dayton Cylinder Scale"?

A. Yes, sir.

Q. 7. Is the cylinder itself in any way modified from its condition as it appeared in the original scale, and if so, state the changes that have been made?

A. The shaft, the quarter-inch shaft upon which the cylinder was originally mounted, was removed and a tool steel shaft of similar size and weight substituted, so that the bearing ends could be turned down to the proper size and hardened to permit them being mounted in ball bearings. A pinion of the same style and character that we use in the regular cylinder which we put out in this exhibit machine was added to the shaft in order that a rotary motion could be transmitted to this drum by means of the rack which operates and gets its motion from the lever. We also, at the pinion end of the drum, fastened a brass weight to the cast iron spider at that end, in order that the drum could be balanced within a certain limit, so that the drum complete is about two ounces heavier than it was in the original Defendant's Exhibit Dayton Scale.

Q. 8. What necessitated the addition of this counterweight?

A. On account of the drum being so much out of balance that the rack would not remain in positive mesh with the pinion.

Q. 9. The drum was substantially counterbalanced in the original scale, was it not, that is to say, in the Dayton scale?

A. No, not necessarily.

Q. 10. Then this weight was added, was it, because the drum was an unbalanced drum?

A. Yes, sir.

Q. 11. You have stated, have you, all the changes that were made in the drum and its connection to the supports and operating means?

A. Yes, sir, but I neglected to state that the lining wire has been moved inward on account of this drum being a little smaller in diameter than the drum which originally was made for this scale.

Q. 12. Are the cylinder ends the same as before, except for the addition of the counterweight?

A. Absolutely.

Q. 13. How about the paper cylinder?

A. The paper cylinder is the same.

Q. 14. Have you changed the indications upon the paper cylinder to make them read correctly?

A. No, sir; I have not.

Q. 15. The drum as it stands, then, does not indicate correctly the amount of weight placed on the goods receiver?

A. No, because there are no graduations on this drum to indicate weight in rotary position.

Q. 16. Will you please take the weight marked with the numeral "10" which you find by this scale, and impose it upon the goods receiver, say a dozen times as nearly as you can in the manner in which a merchant or other user of the scale would put commodity upon the platform, and observe how greatly the point to which the cylinder returns each time the weight is added varies?

A. I have placed the ten-pound weight on the platform of this scale twelve different times and find that the cylinder comes every time to the same position of rest with the indicating line or indicating wire on the scale.

Q. 17. If the chart were properly graduated to suit the scale, would the scale be operative and accurate within commercial requirements?

By Mr. Richmond: Objected to as leading.

A. Yes, sir.

Q. 18. Did it, in your judgment, or did it not, require invention to assemble this Dayton scale chart in this Toledo scale and make it operative to the extent that it is operative at present?

By Mr. Richmond: Objected to as incompetent.

A. I do not think it required any invention to place the cylinder in this exhibits scale.

At this point a recess was taken to 7:30 P. M.

7:30 P. M.

Met pursuant to adjournment. Present as before.

Q. 19. To your knowledge, how long have ball bearings been a matter of common knowledge in the mechanical art?

A. Well, I can say they have been in common use to my own recollection for twenty-five years past.

Q. 20. Who was the workman that mounted this Dayton cylinder in the Toledo housing in the scale with reference to which you have been testifying?

A. His name is Beard; I don't know his initials.

Q. 21. What were your full instructions to him, as near as you can recollect them?

A. I had the scale sent up to the experimental room, which had a regular chart like that we put out in that scale in the regular course of trade, had the scale placed upon his bench, handed him the chart from the Dayton scale which I had previously taken out, told him to remove our style of chart, change the bearings to ball bearings, and mount the Dayton chart upon a shaft which could be hardened and turned down to fit these bearings, and also to put on a pinion on this shaft similar to the one which was on the chart which he previously took from the scale, and also to add a counterweight to the chart, and place same in such a position that the chart or drum would be balanced in any position in the bearings with the rack of the scale disconnected from same. Those are all the instructions I gave him.

Q. 22. And without further instruction of any sort did he assemble the scale?

A. Yes, sir; except that I told him to move the lining wire to a point inward to accommodate the smaller diameter of this chart.

Q. 23. What is Beard's job or position in the factory?

A. He is a tool maker by trade.

Q. 24. Is there any other Beard employed in the factory?

A. Not to my knowledge.

Q. 25. Do you know his front name?

A. I do not, because he was put to work while I was in Chicago, about three weeks ago.

By Mr. Macauley: The scale above referred to is put in evidence, is offered in evidence, and it is requested that it be marked for identification, "Defendant's Exhibit, Toledo Scale with Dayton Chart."

Direct examination closed.

Cross-Examination by Mr. Richmond.

XQ. 26. Whose idea was it to put this drum in this scale?

A. Mr. Davis, one of our attorneys, suggested the idea to me that I try out that experiment upon my return to Toledo.

XQ. 27. Is this drum that you put in here a duplicate of the drum in the Defendant's Exhibit Dayton Cylinder Scale.

A. Yes, sir; it is, all but the shaft, which is of the same diameter and weight.

XQ. 28. Does the drum have the same weight as the drum in the said Defendant's Exhibit Dayton Cylinder Scale?

A. In fact, it is about two ounces heavier, owing to the fact that we have added a pinion onto the shaft, and a brass weight screwed to one of the cast iron ends to bring the drum to a balance.

XQ. 29. Then, aside from these two additions that you have just mentioned, the drums weigh the same, do they?

A. Yes, sir.

XQ. 30. Did you examine this drum to see why it was originally so far out of balance as to require this counter-weight to which you have referred?

A. No; it wasn't necessary. I knew from experience.

XQ. 31. Are these drums always about that much out of balance?

A. A drum of that character would be, made in that way, where the outside of the cast iron spider were not machined to a true diameter to the center through which the shaft was inserted.

XQ. 32. Don't they ever happen to get them to balance?

A. It wouldn't be one chance in ten thousand that that drum would balance.

XQ. 33. What would the chance be that it would be two ounces off on the rim?

A. Well, on the casting there would be no assurance that the castings were of equal thickness or of equal weight either side of center, due to the fact that perhaps the original pattern from which these castings were made was not of equal thickness, and even if it were, the molder in rapping the pattern to take it out of the sand would naturally create an error in the casting, making it thicker on one side than on the other. In addition to this, where a paper or pasteboard of any character is placed around two or more spiders, even if the spiders were either a casting or a punching, and were

absolutely balanced within themselves, without the paper,—where the paper or pasteboard laps over say a quarter of an inch to make the glue joint in order to form a tube, you would have a double thickness of paper or pasteboard at that side which would again throw the drum out of balance.

XQ. 34. How is the gear pinion secured to the shaft in the computation drum of this exhibit scale?

A. There is a hole drilled through the pinion and also through the shaft. This hole is then reamed or broached with a taper broach, and a taper dowel pin driven in to hold the pinion integral with the shaft.

XQ. 35. You would call this scale here an automatic computing scale, would you not?

A. I would if the cylinder which is now in the scale had the proper values properly placed and properly spaced, and also weight graduations properly placed and properly spaced on the outside of this drum.

XQ. 36. Then, in a general way, just what is the proper definition of an automatic computing scale?

A. A scale in which by placing the weight on the platter, the downward movement of the platter which is mounted upon a lever, which lever is connected either to a pendulum or spring mechanism to resist the weight placed upon the platter; of a rack or other means connected from the end of lever to actuate a drum upon which proper values and weight figures are placed, in a proper position.

XQ. 37. Then it is the fact that the rotation of the drum is caused by the weight acting down on the platter that makes it automatic, is it not?

A. Yes, sir.

XQ. 38. Defendant's Exhibit Dayton Cylinder Scale is not an automatic computing scale, is it?

A. No, sir.

XQ. 39. Is the drum precisely the same length as before it was removed from the Dayton scale to which it originally belonged?

A. Yes, sir.

XQ. 40. Just where is it in this scale that end-thrust along the shaft of the drum is taken up or stopped?

A. By hardened thrust screws which are inserted in the center of the bracket which holds the ball-bearing race.

XQ. 41. Did you have to adjust the dash pot any differently after you took out the original drum and put in this one?

A. Yes, that would be a natural consequence, because

changing the capacitw or changing the weight of any chart or any moving mechanism in the scale, would necessitate a slight change of the dash-pot regulator.

XQ. 42. What change did you make; that is, which way did you change the dash pot?

A. Changed the dash pot to close down the port, which would not allow so much oil to pass through the port of the dash-pot plunger.

XQ. 43. That is, you made the dash pot offer an increased resistance, did you not?

A. Yes, sir.

XQ. 44. Now, if the drum that you put in there had been of sufficiently increased diameter to fill the cylindrical casing, but had been the same weight as this drum that is in there now, it would have offered a good deal more resistance of inerita to rotation, would it not?

A. That would depend to a great extent upon how that weight was distributed from the center.

XQ. 45. But the farther the weight is from the center, the greater the rotational inertia of the drum, is it not?

A. I believe that would be correct.

XQ. 46. And then if you increased the weight of the drum in proportion as you increased its cross-section, that would increase the rotational inertia a good deal more, would it not?

A. Yes, sir.

XQ. 47. Did you try any experiments along the lines I have indicated in the last two questions?

A. There was a scale produced in evidence in this case, which is now an exhibit scale for defendant, which has counterweights added to the chart spiders of one of our regular computing drums, these weights being of sufficient weight to bring the total weight of the drum equal to the weight of the drum in Defendant's Exhibit Dayton Scale; said weight of drum being 26 ounces. In this drum the eight brass counterweights which were added to the chart spiders weighed a total of 17⅜ ounces, and these weights were placed in a position as far from the center of the drum as it was possible to place them without changing their construction. I also carried out an experiment along this same line about three years ago, and the results were very satisfactory, having made a chart of a larger diameter than 8½ inches, and the weight of the chart was about 18 ounces.

XQ. 48. Have you made any other experiments along these lines in the last few months, and if so, please tell about them?

A. There was another cylinder scale equipped with eight counter weights, which is also submitted in evidence in this case as Defendant's Exhibit Toledo Scale.

XQ. 49. Any others?

A. No others that I can recall.

XQ. 50. Would a drum of that size in that scale be just as satisfactory as if of the usual size, and please explain why, if your answer is negative?

A. A drum of that size would be absolutely satisfactory for a small capacity scale, depending entirely upon making the graduations either for indicating value or weight so they would be readable under a magnifying glass.

XQ. 51. Is this a small capacity scale?

A. No, sir; it is not.

XQ. 52. Well, I am talking of this scale here, and I want to know whether a drum of the size now in this scale would be just as satisfactory as if of the usual size?

A. That depends entirely upon the capacitw that you want to make the chart indicate.

XQ. 53. In other words, if you want the same capacity as with the usual large drum, then you will need a drum that large, will you not?

A. If you want to allot the same space to show a pound indication, that would be correct.

XQ. 54. Well, in this drum the way your company ordinarily manufactures it, they don't allot any more space to show a pound indication than they think is proper for that purpose, do they?

A. That is not altogether governed by the pound indication, but more dependent upon the higher price per pound that you want the scale to compute in money value.

XQ. 55. What is the capacity of this scale in its normal original condition, with respect to pounds, and dollars and cents?

A. We place cylinders in this same size casing, making the capacity of that scale from a fifteen-pound capacity up to a fifty-pound capacity, the drums all being of equal diameter.

XQ. 56. Then you don't make your drums any smaller for small capacity scales?

A. Yes, sir; we do. Any scale under fifteen pounds capacity the drum is made considerably smaller; very little larger than the diameter of the drum in Defendant's Exhibit Dayton Scale.

XQ. 57. Why didn't you put this Dayton cylinder in such

a scale, then, and not have so extreme a misfit as in this instance?

A. It wouldn't have made a particle of difference as to the result, so the matter of whether the scale was a misfit or not doesn't in any way that I can see enter into the point to be shown.

XQ. 58. Is that the best reason you can think of in answer to the foregoing question?

A. The only reason is always the best reason.

XQ. 59. Weren't you afraid this drum would be too heavy for a little scale, and so you put it into a good, big, strong one?

A. Absolutely not. When we have shown, and which I have testified to in a former deposition, of the testing of a larger sized drum with the increased weight of the chart thrown as far from center as was possible to make it, it was a much more severe test to be required of the scale, in my opinion, than this drum placed in this Defendant's Exhibit Toledo Scale with Dayton Chart.

XQ. 60. Well, was this other test that you refer to with the small capacity scale?

A. It was the next to the smallest capacity chart that we use in this larger sized casing.

XQ. 61. How many different sized charts do you put out on your automatic computing scales altogether?

A. Two sizes.

XQ. 62. What are those sizes, please?

A. The larger size to my recollection, is about 8⅝ inches in diameter, while the smaller size, to the best of my recollection, is something like 7 inches.

XQ. 63. Then, although you have a drum here decidedly less than 7 inches, you passed by your scale adapted for the smaller sized drum and took a scale adapted for the largest sized drum for this exhibit. Is this correct?

A. As I could see that it made no difference in the result of the experiment, I took the first scale I could get ahold of that was a damaged scale, that had a damaged appearance, to save building up a new scale for this exhibit.

XQ. 64. What was the matter with the bearings that you took out and replaced by the ball bearings?

A. There was nothing the matter with the bearings, in my opinion.

XQ. 65. Why did you make this change?

A. Because I knew from past experience that the result

of adding an increased weight on a chart was not so much the adding of the weight itself, but the manner in which the cylinder shaft of the drum was mounted.

XQ. 66. Can you add any further explanation to make the foregoing answer a little clearer?

A. I can.

XQ. 67. Please do so.

A. Increasing the weight of a chart does not affect, in my opinion, the sentistiveness of the weighing of the scale if it is mounted in proper bearings. These bearings are very similar in construction to bearings which we put out on scales in the regular course of trade for over a year.

XQ. 68. What kind of bearings were on there before?

A. Roller disk bearings.

XQ. 69. Then did you consider that "roller disk bearings" were not "proper bearings," and that ball bearings were proper bearings?

A. I would not say that the disk bearings are not a proper bearing to put out on a scale, although I personally advocate a ball bearing for reasons of the ball bearing being more dust proof and would be less liable to accumulate dust and dirt if put on an exhibit scale where it would lay around for months before it would be called upon to be used as testimony in the case again.

XQ. 70. You spoke of this scale here having "a regular chart" in it when you took it to Beard to have him place the Dayton chart. What was the capacity of that regular chart in pounds?

A. Twenty-four pounds.

XQ. 71. Is that drum that is in there now large enough to carry conveniently all the weight divisions and other divisions and marking that were on the drum that you took out?

A. No, it wouldn't be and do it satisfactorily.

XQ. 72. If you increase the weight of the drum in such a scale as this at points far out on the drum from the shaft, does that necessitate any change in the dash-pot, and if so, to increase or decrease its resistance?

A. The dash-pot would necessarily have to be adjusted to offer a little more resistance, but would not affect the sensitiveness of the scale.

XQ. 73. That is, in your opinion, the sensitiveness of the scale depends upon the friction of the drum in its bearings, which is naturally less the lighter the drum; is this correct?

A. Not altogether. The sensitiveness of a scale depends upon its mechanical construction and principle of construction, and the accuracy with which all bearings are made.

XQ. 74. But these things being equal, then the lighter the drum the less friction in the bearings, and the more accurate the scale; is not this true?

A. It has not shown itself to be so in the experiments which we made with "Defendant's Exhibit Toledo Scale No. 1" and "Defendant's Exhibit Toledo Scale No. 2" for the reason that until the weight of the chart has been increased to such a capacity as to overload or destroy the sensitiveness of the bearing upon which the shaft is mounted, very, very, little change would take place in the accurcay of the scale.

XQ. 75. In other words, you find there is a little leeway within which you can vary the weight of the drum without impairing its sensitiveness to any objectionable degree, do you not?

A. I have proved that to my own satisfaction within a certain limit; yes, sir.

XQ. 76. Please point out the damage on this scale that you referred to in answer to XQ. 63?

A. In the first place the scale has been used as a salesman's sample and carried around the country in a sample trunk. The enamel of the scale being marred at a point on the end of the weighted lever and at a point on the base directly under the end of the lever; the front of the base is scratched, also either side, which would compel the machine to be torn down, stripped of all its enamel, refinished and reassembled before it could go out as a new product of the Toledo Scale Company. The platter is also scratched, which would also either have to be repolished or a new platter substituted.

XQ. 77. This scratching of the enamel in certain places, and very slight scratching of the glass platter, constitutes the damage that you referred to, does it?

A. Yes, sir, this damage being just enough so that the salesman could not sell it as a new scale built by our company, for he would naturally have to make a considerable reduction in price, and a certain per cent of that reduction would come out of his own commissions.

XQ. 78. Am I correct in understanding you that when you replaced the normal sized drum in this scale by the small drum that is in there now you increased the resistance of the dash-pot, and that if you were to put in a drum of larger size

than this one that is in there now, but moving the weight out farther from the shaft and increasing the weight proportionally, then you would have to increase the resistance of the dash-pot still further?

A. That statement is correct.

Cross-examination closed.

Redirect Examination by Mr. Macauley.

RDQ. 79. How difficult a matter is it to correctly counterbalance a cylinder like the Dayton cylinder in the Toledo scale?

A. It is quite a difficult matter to get the right amount of weight properly placed, because in this instance the weight had to be located and then a hole drilled through the casting to receive it, and in drilling the hole and putting the screw in, it would naturally throw the chart slightly out of balance again.

RDQ. 80. The difficulty presented then is purely mechanical, is it?

A. Yes, sir.

RDQ. 81. Is an automatic computing scale necessarily provided with a cylinder or may it have other indicating means?

A. It may be of a cylinder type, or it may be a stationary chart with a revolving indicator, or it may be a fan-shaped stationary chart with the indicator passing over the segment of the chart.

Recross Examination by Mr. Richmond.

RXQ. 82. If a scale has a drum that does not rotate by the action of the weight placed on the platform or scoop, but this drum rotates only by hand, would you call it an automatic computing scale?

A. Certainly not, unless the poise operated or rotated the drum in its operation of being slid across the beam, then I would call it an automatic drum.

Recross examination closed.

Deposition closed.

CLARENCE H. HAPWOOD.

At this point an adjournment was taken to the offices of Rector, Hibben, Davis & Macauley, 332 Michigan Avenue, Chicago, before Robert Dobberman, a Notary Public in and

for the County of Cook, State of Illinois, at 10 o'clock A. M., February 10th, 1912.

State of Ohio, } ss.
Lucas County, }

I, Solon T. Klotz, Notary Public, hereby certify that the above witnesses, W. P. Kiser, O. C. Reeves and C. H. Hapgood, were by me first duly sworn to testify the truth, the whole truth, and nothing but the truth; that their depositions were reduced to writing by Mr. W. J. Billingslea in the presence of the said witnesses respectively, and when completed read over to said witnesses respectively, and subscribed by them in my presence and in the presence of such of the parties and counsel as attended; that said depositions were taken pursuant to due notice, at the office of Solon T. Klotz, at 921 Nicholas Building, Toledo, Ohio, on the 9th day of February, 1912; that the parties were represented at the taking of said depositions by their respective counsel as set forth; that the several exhibits recited were offered in evidence and marked as specially noted in the foregoing depositions; and that I am not counsel or relative of either part, or otherwise interested in the event of this suit.

In testimony whereof I have hereunto set my hand and official seal, this twelfth day of February, 1912.

SOLON T. KLOTZ,
(Seal) *Notary Public, Lucas County, Ohio.*

Chicago, February 10, 1912.

Met pursuant to adjournment. Parties present as before.

Thereupon the parties hereto by their counsel stipulated as follows:

(1) That Union cash registers of which that heretofore introduced in evidence marked "Complainant's Exhibit Union Cash Register" is a specimen, were upon the market in this country as early as the year 1891 and for several years thereafter.

(2) That inasmuch as complainant expects to examine one or more witnesses at Boston, Mass., defendant may examine witnesses there in complainant's rebuttal time nunc pro tunc, it being understood and agreed that said witnesses will be examined on the same occasion as complainant's witnesses at

Boston since the purpose of this stipulation is to save two trips of counsel to Boston.

UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company *vs.* Toledo Computing Scale Company. } In Equity. No. 30,024.

Testimony taken on behalf of defendant under the foregoining stipulation between counsel.

Present:

Carl A. Richmond, Esq., for complainant.

Frank P. Davis, Esq., for defendant.

EDMUND R. CROSS, a witness called on behalf of the defendant, testified as follows in answer to questions by Mr. Davis, having first been cautioned that he is later to be put under oath.

Q. 1. Please state your name, age, residence and occupation?

A. Edmund R. Cross, 772 Huntington Avenue, Boston, Massachusetts; scale expert; age, 44.

Q. 2. When did you first become connected in any way with the scale business?

A. When I was about fifteen years of age, in Philadelphia.

Q. 3. State briefly the subsequent history of your connection with any similar business.

A. My first experience was with the Southwark Scale Company, Philadelphia, Pennsylvania, being there about six years. From there I went to The Computing Scale Company, of Dayton, Ohio, in November, 1891.

Q. 4. Have you preserved any written evidence of any sort to which you can now refer by way of substantiating the statement just made by you as to the time when you went with The Computing Scale Company, of Dayton, Ohio?

A. I have all the correspondence under which I procured a position.

Q. 5. Can you now produce a piece of written evidence of this character which will show the time when you went with the Dayton Company?

A. I have here a reply from them, dated October 31st, 1891.

Q. 6. How soon after the receipt of the letter just referred to did you go to work for The Computing Scale Company, of Dayton, Ohio

A. In a very few days.

Q. 7. Did you receive this letter in the regular course of the mails and have you had it in your possession since its receipt by you?

A. Yes, sir; it was delivered to me through the United States mails. Yes, it has been in my possession ever since.

The aforesaid letter is offered in evidence and the notary is requested to mark the same "Defendant's Exhibit Cross Letter."

Q. 8. What sort of work were you put upon when you were first employed by The Computing Scale Company, of Dayton?

A. Upon scale work in general, such as filing levers and assembling and adjusting the scales.

Q. 9. How long did you continue at that sort of general work and what were you next assigned to do in the factory of that company?

A. I was inspecting scale parts and sealing scales.

Q. 10. About when did you become an inspector and sealer in that factory?

A. My work was such that I would go from sealing to inspecting scale beams and other scale parts off and on for about three years, and then I was permanently put to sealing and adjusting scales.

Q. 11. Where was the factory of The Computing Scale Company of Dayton located at the time when you were first employed by that company?

A. On the lower floor, the first floor of the Callahan Power Building, Dayton, Ohio.

Q. 12. Did the company continue to occupy that first floor during all of the period of your employment, and if not, when was the removal made from that floor of said building, as near as you can recollect?

A. I think we were on the first floor while I was with them for about two years and we moved from there to the third

and fourth floors of the same building, remaining there until we moved to the old woolen mill building along the canal, I have forgotten the name of it.

Q. 13. Do you remember whether the company was occupying the first floor at the time when you became a sealer and adjuster?

A. Yes, they were on the first floor while I was sealing.

Q. 14. What sort of scale was the company manufacturing at or about the time when the removal was made from the first floor of the Callahan Power Building to the upper floors?

A. They were making what they called a standard market scale and the scale they called a tea scale and a counter cylinder scale.

Q. 15. Will you describe in a general way how this cylinder scale to which you have referred was made up, that is, what its general construction was?

A. It was a counter scale, with a cylinder fastened permanently to the base. Inside of this cylinder was a drum with computations on it and a knob on the end of this drum by which you could turn the said cylinder to set the price per pound within the range of the scale.

Q. 16. Can you refer to anything which would afford an illustration of that cylinder scale as it was being manufactured at that time in the factory of The Computing Scale Company in Dayton?

A. Yes, I have several.

Q. 17. Will you please produce, if you can, such of those illustrations as may be at hand?

A. There is one on the letter-head of a letter I received from Mr. Mellinger, then superintendent. The one in the right-hand corner on letter-head dated in the year 1894, seventh month, twenty-fifth day, 1894. Also two illustrations here in The Balance, dated 1894. Those are on the two inside pages.

Q. 18. What is the type of scale illustrated on the front page of The Balance of 1894, and the upper left-hand corner of the letter that you produced?

A. It is called their standard market scale.

Q. 19. What was the nature of this publication called The Balance; that is, who got it out and how often was there an edition of it?

A. Well, as to the nature of that sheet, I cannot say who the author was nor what they wished to convey to the pub-

lic. The sheet called The Balance was issued by The Computing Scale Company, Dayton, Ohio, and the person who got it out I do not know and I do not know how often it was issued.

Q. 20. Are you able to produce a specimen of this publication for the year 1893? And if not, you may state whether you searched for a copy of same among your effects.

A. As to The Balance of 1893 I don't think I have it. I can produce 1894, 1895, and one that I have that I don't see any date on.

Q. 21. Referring now to The Balance of 1894 and the illustrations that you mention as appearing on the inside pages thereof, please state what the character of these illustrations is as to the type of scale that you referred to as a cylinder scale.

A. These two illustrations are the same to which I have reference. It pictures a butter scale and a confectioner's scale having the said cylinder and drum. It is shown in use in a store, that is, in the act of weighing; what it is they are weighing I couldn't say.

Q. 22. Can you state what individual is pictured as using the scale in the illustration which appears on the second page of this copy of The Balance?

A. It is a picture of a young lady whom we know as Miss Kepler—Lutie Kepler.

Q. 23. Please look at the copy of patent which I hand you (Defendant's Exhibit Kepler Patent) and state how the scale there depicted compares in general with that illustrated in The Balance of 1894.

Objected to as immaterial, irrelevant and incompetent.

A. The illustration on the patent sheet is very similar as to the cylinder. Other details not so prominent.

Q. 24. What is the user of the scale represented as in the act of doing in the picture on page 3 of the 1894 Balance?

A. He is in the act of weighing an article appearing to be butter.

Q. 25. What, if anything, with reference to the computing part of the scale?

A. He is in the act apparently of setting the price per pound.

Q. 26. What sort of manipulation is he represented as performing to accomplish this setting?

A. He appears to be setting the chart at the price per pound.

Q. 27. What is he represented as using to do this setting?

A. He is using the knob on the end of the cylinder, used for setting the price per pound.

Q. 28. What was the construction of the computing drum of those cylinder scales that you referred to as manufactured in the factory of The Computing Scale Company at Dayton, Ohio, at or about the time when the removal was made from the first floor of the Callahan Power Building? That is, what was the construction of the drum?

A. My recollection of the chart on the said scale were all black figures.

Q. 29. What different parts entered into the construction of the complete drum of those scales?

A. It was a paper cylinder with two cast iron ends, rod running through center, with a knob on the end of rod used for turning the chart.

Q. 30. I invite your attention to the drum or cylinder of Defendant's Exhibit Dayton Cylinder Scale and would ask you to state how the construction of that drum or cylinder as to chart and also as to its makeup throughout compares with the chart and construction of drum or cylinder in those cylinder scales that you have stated were being manufactured in The Computing Scale Company's factory at Dayton at or about the time of the removal from the first floor of the Callahan Building.

A. The construction of the chart entirely is about the same, excepting the red figures. The metal parts supporting the chart appear to be about the same.

Q. 31. You referred in one of your previous answers to a copy of The Balance of 1895. If you have that at hand will you please produce it and state what, if anything, it shows as to the scale having any such feature as the computing arrangement of Defendant's Exhibit, Dayton Cylinder Scale?

A. I have here a Balance issued in 1895 illustrating on the inside page a scale called their candy scale, having a cylinder attached to the beam, movable with the beam, with knob to turn the chart to set the price per pound on said scale. The figures on the chart of said scale has two rows of figures appearing at each price per pound. The black figures representing the value to the capacity in figures shown on the beam, and a little weight used for weighing when you go more than the capacity of the beam and red figures on the chart is used when using that weight.

Q. 32. Please state whether or not the scale illustrated

in The Balance of 1894 is there shown as adapted to have such small additional weights applied?

A. The scale in Balance of 1894 appears to have an arrangement there for hanging something on the end of the beam.

Q. 33. Do you recall whether the drum of the candy scale illustrated in The Balance of 1895 differed in any particulars from the drum that we have here (Defendant's Exhibit Dayton Cylinder Scale), and if so, in what particulars, either as to its general make-up or as to the materials employed for any of the parts?

A. The candy scale drum and cylinder was made much lighter, as it had to be made so, so as it would work with the beam. The principle in turning the chart is the same on both scales.

Q. 34. Do you remember how the drum of this candy scale was made lighter than the drum of the scale of which Defendant's Exhibit Dayton Cylinder Scale is a specimen?

A. The parts for the candy scale cylinder and drum were made from thin sheet metal, and on the other scale the ends supporting the chart were made from cast metal, being much heavier.

Q. 25. The particular parts of the candy scale drum that were made of thin sheet metal were the ends or heads, then, were they?

A. Yes, end pieces or heads.

Q. 36. Did you have occasion to seal scales of both the varieties mentioned, to-wit, the scales such as illustrated at pages 2 and 3 of The Balance of 1894 and the candy scale illustrated in The Balance of 1895?

A. I have.

Q. 37. Do you remember about how soon it was after the type of scale represented by Defendant's Exhibit Dayton Cylinder Scale was first manufactured, that the candy scale illustrated in The Balance of 1895 came along?

A. Definitely I could not state, but I know it was very shortly.

Q. 38. How long did you continue in the employment of The Computing Scale Company at Dayton?

A. About five and one-half years.

Q. 39. Do you mean that you were employed by that company five and a half years beginning with your first employment in November, 1891?

A. Yes.

Q. 40. Do you find in the other copy of The Balance to

which you referred any illustration of any scale having a computing cylinder, and if so, please point it out?

A. I have here a Balance sheet illustrating a Dayton even-balance computing scale involving the same principles.

Q. 41. How is the cylinder or drum of that scale arranged?

A. The cylinder and drum is attached to the beam, movable with the beam, having a knob to turn chart to set the price per pound the same as the candy scale and the other cylinder scales.

Q. 42. Did you also have occasion during your employment by The Computing Scale Company at Dayton to inspect and seal scales of the type you term "even balance computing scale," such as illustrated in the copy of The Balance just referred to by you?

A. I had occasion to assemble and adjust scales, meaning the even-balance scales, while with the Dayton Computing Scale Company.

Q. 43. How did the drums or cylinders of these even-balance scales compare in construction as to parts employed and materials thereof with the drum or cylinder of the candy scale illustrated in The Balance of 1895?

A. The chart in the even-balance scale was a metal chart, and the chart in the candy scale, as I recollect, was a paper chart.

Q. 44. How do you happen to have had in your possession these copies of The Balance that you have produced here, and you may state how long they have been in your possession.

A. I have had these balance sheets ever since they were issued, and they came into my possession by getting them at the factory of The Computing Scale Company of Dayton, Ohio, and I have retained them ever since.

Q. 45. Please look at page 3 of The Balance containing the illustration of the even-balance scale and state whether or not anything appears there to indicate in any way the date of issuance of same.

Objected to as leading and incompetent.

A. I see on page 3 of one Balance sheet two dates, 1892 and 1896.

Q. 46. Where were you when you received this letter from Mr. Mellinger, to which letter you referred as dated July 25th, 1894?

A. I was in Philadelphia.

Q. 47. You were in the employ of The Computing Scale Company at that time, were you?

A. I was.

Q. 47a. How did you happen to be in Philadelphia?

A. I was there on a vacation.

Q. 48. What did this letter indicate, if anything, as to what was going on at the factory in Dayton with reference to the manufacture of cylinder scales?

Objected to as leading and incompetent and calling for secondary testimony.

A. At the time I was in Philadelphia we were making a standard market scale, also that type of cylinder scale, with a cylinder attached to the base.

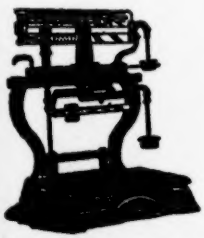
Q. 49. What is there in the letter that indicates that?

Same objection.

A. I have here a letter from Mr. F. E. Mellinger, then superintendent of the factory of The Computing Scale Company of Dayton, Ohio, in reply to a letter I wrote to him asking for an extension of my time to be away from the factory. And he writes, "they are making 125 standard scales and about 35 cylinder scales a week."

The letter just referred to by the witness is offered in evidence and the notary is requested to mark the same "Defendant's Exhibit Mellinger Letter."

Defendant's Exhibit Mellinger Letter.



Capital, $160,000.00.

THE COMPUTING SCALE CO.

DAYTON, OHIO.

E. CANBY, President.
O. O. OSLER, Gen'l Manager.

7/25/94

Friend Ed,

Yours of the 22nd just received. You can have two weeks more if you like. I suppose you are haveing a good time. we are running 125 Standards & about 35 Cylinders a week with prospects very fair as far as we can see at present.

Thanking you for your information I remain

Yours very Truly

F. E. MELLINGER.

The first trade publication referred to by the witness is offered in evidence and the notary is requested to mark the same "Defendant's Exhibit 'The Balance' of 1894."

The second trade publication produced by the witness is offered in evidence and the notary is requested to mark the same "Defendant's Exhibit 'The Balance' of 1895."

The third trade publication produced by the witness is offered in evidence and the notary is requested to mark the same "Defendant's Exhibit Computing Scale Company Publication No. 3."

By Mr. Richmond: "Defendant's Exhibit Mellinger Letter" is objected to as irrelevant and immaterial to the issues of this controversy and secondary and incompetent and constituting no proper proof of the statements contained therein.

The remaining three exhibits just offered are objected to as not proved as to publication dates, and not constituting any proof whatever of the statements contained therein and as irrelevant, immaterial and incompetent.

Direct testimony closed.

Cross-Examination by Mr. Richmond.

XQ. 50. What was the date of your leaving the employ of The Computing Scale Company of Dayton, Ohio, and what have been your business connections since that time?

A. I left The Dayton Computing Scale Company about February, 1897, being employed after that date by the National Computing Scale Company of Cleveland, Ohio, as general scale mechanic. I was with the National Computing Scale Company for about four years, leaving them to go with the Wilmore Computing Scale Company at Newark, New Jersey, where I remained for about two years, going from them with the Micrometer Scale Company in Troy, New York, where I remained for eighteen months, going from there to Bridgeport, Connecticut, to the Automatic Computing Scale Company, where I remained just one year, leaving there to come here at Boston with the Chadwick & Carr Company, still in the scale business, where I have been for the past six years.

XQ. 51. What types or makes of computing scales do you handle in your present business?

A. We have various kinds which we repair for customers.

XQ. 52. Don't you handle any new computing scales, or is you line—

A. In a general way we do not handle a line of new computing scales of any kind.

XQ. 53. All the cylinder scales that you have described as manufactured by The Computing Scale Company of Dayton while you were there were of the type in which the cylinder is rotated by hand, were they not?

A. They were.

XQ. 54. There were none of them automatic computing scales, were they?

A. There were none of them automatic.

XQ. 55. In all of these scales, if you merely wanted to get the weight, you let the cylinder alone, but if you wanted to get the value, then in addition to adjusting the poise for weight, you also rotated the cylinder to get the proper price. This is a correct statement, is it not?

A. Yes.

XQ. 56. Are you able to tell in what part of the year 1895 The Balance bearing that date was issued, or was it soon after that year?

A. I have no definite time by which I could state the exact day those Balances were issued.

XQ. 57. What was the drum made of in the candy scale pictured in The Balance for 1895?

A. As I recollect, it was made of paper.

XQ. 58. Do you know of any reason why the chart in the even-balance scale was made of metal, while the charts in the other scales which you have described were made of paper?

A. Well, there was no definite reason why they should be any different in that type of scale to which Mr. Richmond has just referred.

XQ. 59. All of these computing drum scales might as well have had their charts made of sheet metal, might they not?

A. A scale could be constructed so as to use either.

XQ. 60. Did the mere act of placing the article to be weighed upon the platform or in the scoop have any effect upon the drums in any of these scales that you have described to adjust them at the proper setting?

A. Any article placed on either scale, either in the scoop or on the platform, could be weighed if not more than the capacity of the scale. No, the drum can be set with the scale loaded or empty.

XQ. 61. What was the earliest automatically revolving drum scale that was successfully put on the market, to your knowledge?

A. That I could not definitely say.

XQ. 62. Up to the time you left Dayton was there any such automatically revolving drum computing scale on the market, so far as you know?

A. I believe there was in Boston a scale called the old Boston computing scale that worked automatically.

XQ. 63. Was this ever called the Boston butcher scale?

A. That I do not know.

Cross-examination closed.

Redirect Examination by Mr. Davis.

RDQ. 64. Can you state whether the cylinder scales referred to in the Mellinger letter were candy scales, such as illustrated in The Balance of 1895, or cylinder scales like Defendant's Exhibit Dayton Cylinder Scale, or both?

Objected to as incompetent.

A. He had reference to the cylinder scale, with the cylinder attached to the base.

Deposition closed.

EDMUND R. CROSS.

Commonwealth of Massachusetts, } ss.
Suffolk. }

I, Albert Garceau, a notary public in and for said County and Commonwealth, duly commissioned and authorized to administer oaths and to take and certify depositions, do hereby certify that, pursuant to an annexed motion issued and served in the civil cause depending in the District Court of the United States for the Northern District of Illinois, wherein The Computing Scale Company is plaintiff and Toledo Computing Scale Company defendant, I was attended to the office of Thomas A. Mullin, No. 15 State Street, in Boston, by Carl A. Richmond, counsel for said plaintiff, and also by Frank P. Davis, counsel for defendant, on the several days and dates hereinbefore stated; that the aforesaid witness, Edmund R. Cross, who was of sound mind and lawful age, and was by me first carefully examined and cautioned and duly sworn to testify the truth, the whole truth and nothing but the truth, and he thereupon testified as above shown, and that the deposition by him subscribed as above set forth, was reduced to typewriting by Helen M. McDermott, under my personal supervision, in the presence of the witness himself,

and from the statements of him, and was subscribed by the said witness in my presence, and was taken at the place in the annexed motion specified and at the times as set forth, adjournments being had or taken from day to day as provided for in said notice, and that all was done, written and signed in the presence of said counsel for said plaintiff and defendant. I further certify that the reason for taking the depositions was and is, and the fact was and is, that the deponent lives at Boston, more than one hundred miles from the place where the said civil issue is appointed by law to be tried; that I am neither of counsel nor attorney to either of said parties to said suit nor interested in the event of said cause, and that it being impracticable for me to deliver said deposition and the exhibits thereto attached with my own hands into the court for which they were taken, I have retained the same for the purpose of being sealed up and directed with my own hand, and speedily and safely transmitted to the said court for which it was taken, and to remain under my seal until there opened.

As witness my hand and seal as such special examiner at Boston on this eighteenth day of March, 1912.

ALBERT GARCEAU,
Notary Public.

(SEAL)

COMPLAINANT'S REBUTTAL TESTIMONY.

IN THE UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company,
Complainant,
vs.
Toledo Computing Scale Company,
Defendant.
} In Equity. No. 30,024.

NOTICE FOR TAKING TESTIMONY.

Please take notice that on Tuesday, February 20, 1912, in our office in the Marquette Building, Chicago, Illinois, commencing at 10 o'clock a. m., we shall take testimony in behalf of the complainant in the above-entitled cause. This testi-

mony will be taken in accordance with the equity rules before A. C. Courtenay, Notary Public, and Special Examiner by agreement of counsel. You are invited to attend and cross-examine.

Respectfully submitted,
SHERIDAN, WILKINSON, SCOTT & RICHMOND,
Of Counsel for Complainant.

To
Rector, Hibben, Davis & Macauley,
McCormick Building,
Chicago, Illinois.

Service of the above notice acknowledged this 17th day of February, 1912.

RECTOR, HIBBEN, DAVIS & MACAULEY,
Of Counsel for Defendant.

UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company,
vs.
Toledo Computing Scale Company. } In Equity. No. 30,024.

Testimony in rebuttal taken on behalf of complainant, pursuant to the Statutes and Equity Rules, before Annie C. Courtenay, a Notary Public, acting as Special Examiner by consent, at the offices of Messrs. Sheridan, Wilkinson, Scott & Richmond, No. 140 South Dearborn street, Chicago, Illinois, Tuesday, February 20, 1912, at 10 o'clock a. m., pursuant to notice and agreement of counsel.

Present:

Carl A. Richmond, Esq., for complainant.
Frank P. Davis, Esq., for defendant.

ARTHUR F. POOLE, a witness produced, sworn and examined on the part of complainant, deposes and testifies as follows, in answer to questions by Mr. Richmond:

Q. 1. Please state your name, age, residence and occupation.

A. Arthur F. Poole; 39 years, 1246 Columbia Avenue, Chicago, Ill. I am a mechanical expert.

Q. 2. Please state in brief outline the training and experience you have had that would tend to qualify you to examine into and report on mechanical problems.

A. I was graduated at Stanford University, Cal., in a course principally of mathematics and physics in 1896. Since then I have been employed in designing and constructing various machines.

Q. 3. Please mention some of the kinds of machines on which you have worked, as just stated.

A. At present I am designing adding machines for the Wahl Adding Machine Company, of this city. I have designed a frequency motor for measuring the frequency of alternating currents, which is now being sold by the Holtzer-Cabot Electrical Company, of Brookline, Mass. I invented and designed a telephone party line lockout, which is being sold by the Mountain State Electric Company, of Wheeling, W. Va.

Q. 4. To what extent are you familiar with the testimony and exhibits in this case?

A. I have read part of the testimony of Mr. Milburn, and have examined the sketch and parts of a model of his scale.

Q. 5. Mr. Milburn testified that the graduation of his scale shown in his sketch was uniform. I will ask you if you have made any investigation to determine the accuracy of this scale on this basis, and if so, please state briefly what your investigation has been and what result you found?

By Mr. Davis: That portion of the question purporting to state what the witness Milburn's testimony was, is objected to as incompetent, since the testimony of said witness is not set forth in his language; also objected to as immaterial and irrelevant.

By Mr. Richmond: Attention is directed to Milburn's third deposition, XQs. 90, 91, 145 and 159.

A. I have made such an investigation in order to determine the relation of the forces necessary to hold the platform a given distance from its normal position, and find that these forces do not vary directly as the platform displacement; consequently, if a uniformly divided scale were put on the drum shown in Mr. Milburn's sketch, such a scale would not indicate correctly the weight on the platform.

Q. 6. Please state what data you had to work from, using a sketch to point out your data, if you find it convenient.

Objected to as immaterial and irrelevant.

A. I had, first, this sketch, which was traced from Mr. Milburn's drawing; second the lever arm of Mr. Milburn's scale, which arm I measured to obtain the length of the lever arm and the angle marked 124° in the sketch; third, Mr. Milburn's statement, that the lever arms were deflected approximately 45° from the zero to the 20-pound mark on the scale.

Q. 7. Please state a little more specifically what measurements you obtained from this lever arm besides the angle of 124°

Same objection.

A. The lengths marked l and l_1 in the sketch.

By Mr. Richmond: The sketch referred to by the witness is offered in evidence, and the Examiner is requested to mark it "Complainant's Exhibit Poole Sketch."

By Mr. Davis: The offer and receipt in evidence of the exhibit are objected to, as irrelevant, immaterial and incompetent.

Q. 8. I notice you state, in answer to Q. 6, that this sketch was traced from Mr. Milburn's drawing; who traced it?

Same objection.

A. I did.

Q. 9. What method of computation did you employ in this work—graphical or analytical?

Objected to as immaterial and irrelevant.

A. I employed both.

Q. 10. Please explain in outline, using your sketch, the steps that you took in making this investigation.

Same objection.

A. I first assumed an initial position of the scale pan, as shown in Mr. Milburn's sketch. I then rotated the lever arm through an angle of 45°, and found a second position of the scale pan. I divided the distance between these two positions into ten equal parts, and found the positions of the lever arm corresponding to those positions of the scale pan. I then deduced the equation of the force necessary to maintain the lever arm in these different positions; then a comparison of these forces would give me the correction to be applied to a uniform scale to make it read correctly.

Q. 11. Please read the equation you have just referred to into the record and explain its terms or factors.

Same objection.

A. $F = K \sin P / \sin(124° - P)$.

In this equation F is the vertical force necessary to be applied to the point E of the lever arm; P is the angle which the lever arm makes with the vertical; and K is a constant

which depends on the weight of the counterweight and the ratio of l to l_1.

Q. 12. Please read into the record in tabular form all the values that you worked out for this equation, noting the corresponding positions of the scale platform, the corresponding weights on the scale platform, and the corrections that you found would be necessary.

Same objection.

A.

Pos.	Force.	F—1.78.	(F—1.78)320/690.	Cor.
1	20.05			
2	15.50			
3	13.24			
4	11.63			
5	10.50			
6	9.54			
7	8.68	5.90	320	0
8	7.89	6.11	284	+4
9	7.22	5.44	254	+2
10	6.55	4.77	221	+3
11	5.90	4.12	191	+1
12	5.25	3.47	161	—1
13	4.61	2.83	131	—3
14	3.98	2.20	102	—6
15	3.28	1.50	69	—5
16	2.56	.78	36	—2
17	1.78	.00	0	0
18	.92			
19	.0			

Q. 9. Which of these nineteen positions correspond to zero load on the scale pan?

Same objection.

A. Position No. 17.

Q. 10. And which position corresponded to 20 lbs. load on the scale pan?

Same objection.

A. Position No. 7.

Q. 11. How were the positions outside the range from 7 to 17 determined?

Same objection.

A. By assuming a motion of the scale pan beyond its 20 lb. position by equal increments, finding the corresponding angles of the lever arm, and computing the forces in these positions. This refers to the positions from 1 to 7. A simi-

lar method is pursued for positions 18 and 19, except the motion was assumed beyond the zero position.

Q. 12. Do the figures in the second column give actual forces, or are they merely proportional forces?

Same objection.

A. These figures give only proportional forces; they must be multiplied by a constant to translate them into concrete forces.

Q. 13. Where do you get the "1.78" at the head of column 3?

Same objection.

A. That is the variable factor of the force equation when the pan is in its assumed zero position.

Q. 14. Does it appear at an earlier stage? If so, please point it out.

Same objection.

A. It appears in position 17 in the column headed "Force."

Q. 15. In what unit are the fifth and sixth columns expressed?

Same objection.

A. In ounces.

Q. 16. Can you tell us from your table what the actual weight would be on this Milburn scale when it indicates 4 lbs., that is when it indicates 64 ozs., and if so, please explain just how you use the table to get this information from it?

Same objection.

A. When the Milburn scale indicates 64 ozs., the weight on the pan would be 69 ozs. The table of forces in the second column is used in this way: A zero position is assumed at point 17, and a 20 lb. position is assumed at position 7. Reference to the table will show that the forces at these points are 1.78 and 8.68, respectively. The difference between these two forces is 6.90. The difference 6.90 should correspond to a difference of 320 ozs., so then to find the force at any intermediate position, such as x, we have the following proportion: 6.90 is to 320 as the force (in third column) at position x is to the number of ounces in position x; for example, at position 15 we have the proportion 6.90 is to 320 as 1.50 is to 69.

Q. 17. Then at this position, what correction must be applied to the Milburn scale reading to get the true weight?

Same objection.

A. Five ounces must be subtracted from the scale reading.

Q. 18. Have you plotted any of the values shown in your table, and if so, please produce the resulting diagram and explain briefly what it shows?

Same objection.

A. I have plotted the information contained in my table in the form of a curve; in this the horizontal co-ordinates represent the position of the scale pan; the vertical co-ordinates represent the corresponding forces. The zero position of the scale pan was assumed at position 17, the 320 oz. position at position 7. A straight line was drawn connecting the two points of the curve corresponding to these positions. This line is shown dotted in the figure. If the scale had uniform graduations, the curve should coincide with this dotted line; its departure from it in a vertical direction is a measure of the error of the scale.

Q. 19. Please state whether or not you consider that any more information is necessary to enable a properly qualified person to review your investigation for the purpose of checking it, and if you consider that any such additional information is necessary, please state it now.

Same objection.

A. I think I have given all the necessary information.

Q. 20. What did you find was the distance according to your measurement between the knife edges, the distance designated l_1 on "Complainant's Exhibit Poole Sketch?"

Same objection.

A. 1.03 inches.

By Mr. Richmond: The diagram referred to by the witness in answer to Q. 18 is now offered in evidence, and the Examiner is requested to designate it "Complainant's Exhibit Poole Curve Diagram."

By Mr. Davis: The offer and receipt in evidence of this exhibit are objected to on the ground that it is immaterial and irrelevant.

Q. 21. Have you at hand the drawings and computations which you made in reaching the results that you have stated, and if so, will you please exhibit them to us?

Objected to as immaterial and irrelevant.

A. The graphical part of the work is on this sheet which I now produce; the numerical part is on these yellow sheets which I now produce.

Q. 22. In comparing the dimensions of "Defendant's Exhibit Drawing of Milburn Scale" with the actual Milburn scale, what part or parts did you take as a basis for comparison, and what ratio did you find?

Same objection.

A. For determining the scale of the tracing marked "Poole Sketch" I took the actual length of the lever arm O G and compared it with the length of the same arm on this tracing. This gave me a scale to measure the dimensions of the various parts on the tracing. The actual length of the weight rod O G is 4.82 inches; the length as scaled on the Poole tracing is 2.9 inches; 4.82 divided by 2.9 equals 1.66, the number by which any scaled dimensions on the Poole sketch must be multiplied to get the actual length.

Recess for luncheon.

Met pursuant to adjournment.

Direct examination closed.

The cross-examination of this witness is deferred by agreement of counsel, subject to his recall upon reasonable notice from counsel for defendant.

Adjourned subject to further notice.

Chicago, March 5, 1912.

Parties met pursuant to agreement of counsel.

Present as before.

Cross-examination by Mr. Davis without waiver of any of the objections heretofore noted.

XQ. 23. How would a curve plotted according to the system followed in the plotting of the curve on "Complainant's Exhibit Poole Curve Diagram" differ from the curve of that exhibit diagram if the fulcrum knife edge of "Defendant's Exhibit Milburn Scale Gravity Weight" was fixed in the perforation of the pivot head, which is unoccupied in said defendant's exhibit, but which, according to Milburn's testimony, was occupied by the fulcrum knife edge originally?

A. I could not state what change this proposed construction would make on the curve without an investigation.

XQ. 24. It would make a different curve, would it not?

A. I do not know.

XQ. 25. Are you familiar with actual practices in the scale art having reference to graduation of indicating charts, either cyyindrical or flat, where a pendulum is employed as the weighing medium or the variable load-resisting element?

Objected to as not proper cross-examination.

A. No.

XQ. 26. In connection with your preparation for giving

this present deposition as related to the testimony of Milburn, referred to in your direct examination, did you consider the wooden pivot heads, which Milburn testified he substituted for the brass pivot heads in his automatic hanging scale, which substitute pivot heads are in evidence as "Defendant's Exhibit Milburn Scale Wooden Pivot Heads" and which I now put before you?

Objected to as immaterial and irrelevant in view of RDQs. 163 and 164 of Milburn's testimony.

A. No.

XQ. 27. Have you known of the eccentric disk and flexible band as a form of operating connection between a pendulum and load-supporting element in a weighing scale as a substitute for a crank arm and link, employed for the purpose of compensating for variable resistance of the pendulum under increasing loads, so as to provide for chart graduations uniformly spaced apart?

Objected to as irrelevant cross-examination.

A. Yes, there is a scale before me which apparently has such a cam. I refer to "Complainant's Exhibit Defendant's Scale."

XQ. 28. Are you familiar also with scales of defendant's make which have been on the market for many years, wherein the other form of operating connection is regularly employed, to-wit, such form of connection as illustrated in "Defendant's Exhibit Drawing of Milburn Scale" and in DeVilbiss reissue patent 12,137, a copy of which I show you, to-wit, that form of connection comprising a link and an angular arm at the pendulum fulcrum?

Same objection.

A. I have seen such scales, but until the DeVilbiss patent was shown to me today have not been familiar with their construction.

XQ. 29. Would you say that a curve plotted from operating connections such as illustrated in said DeVilbiss patent, after the same manner that you plotted the curve of "Complainant's Exhibit Poole Curve Diagram" would be of similar character?

Same objection.

A. I could not say positively without an investigation. The construction of this scale is somewhat different from that of the Milburn scale, in that the weight J apparently starts from a vertical position.

XQ. 30. Can you state whether or not there would be tho non-uniform angular advance of the pendulum under suc-

cessive uniform increases of load in the construction illustrated in said DeVilbiss patent?

Same objection.

A. I cannot state without an investigation. I notice that in the DeVilbiss patent the action of the platform is also different from that in the Milburn scale, in that the point of attachment of the link F to the lever A will move in an arc of a circle about the point *a*. This difference might make a change in the character of the curve, which shows the relation between platform displacement and force.

XQ. 31. But there would be, would there, some non-uniformity which would be capable of representation by a curve plotted after the manner of the curve in "Complainant's Exhibit Pooole Curve Diagram?"

Same objection.

A. I could not say what the form of this curve would be without investigation.

XQ. 32. Are you prepared to state whether or not on general principles there would be non-uniformity in indicating graduations where a pendulum is employed as the weighing medium, unless some compensating element was introduced to take care of the matter of variable resistance offered by the pendulum under increasing loads?

Objected to as irrelevant to the direct examination and calling for opinion testimony outside the range of the direct examination, and therefore incompetent.

A. No.

XQ. 33. I now invite your attention to patent 221,826, issued November 18, 1879, to Conrad Jensen for a weighing apparatus, and will ask you to state whether or not this patent affords a correct exposition of the proposition we are discussing, in which connection I invite your attention particularly to the diagram Fig 4 and the description thereof, beginning near the bottom of column 1 of page 2 of the printed specification of said patent and continuing throughout a portion of column 2?

Objection repeated.

A. Assuming that the scale pan always hangs vertical and that the shape of the cam A A^x is such that it will not interfere with the vertical position of the tape, or, in other words, that a perpendicular to the radius vector will not intersect the cam, the reasoning in columns 1 and 2 referred to is correct. However, from the shape of the cam as shown in Fig. 4 it appears that when the weight takes the position C^4, for

instance, the part of the cam from A^3 to A′ will interfere with the vertical position of the tape.

XQ. 34. You consider this patent, then, affords a correct exposition of the proposition in question to the extent of teaching one skilled in the art how to compensate for variable pendulum resistance in a weighing scale, in case it should be desired to have indicating graduations uniformly spaced apart, do you?

Same objection.

A. No, for the reason that the drawing of the scale, as shown in Fig. 4, shows a construction which I do not think would give a uniform scale.

XQ. 35. Do you perceive any essential difference between the cam and band in "Complainant's Exhibit Defendant's Scale" and the cam and band illustrated and described in the Jensen patent?

Same objection.

A. I am unable to say. I do not know the shape of the cam in "Complainant's Exhibit Defendant's Scale."

XQ. 36. Do you find that the weight graduations are equally spaced apart on the cylinder of "Complainant's Exhibit Defendant's Scale?"

Same objection.

A. I am unable to say.

XQ. 37. What would prevent the band in the Jensen construction hanging vertically from that point on the periphery of the cam intersected by the line just above the reference letter A^3, when, in the upward swing of the pendulum to the position represented by C^4, said point on the periphery of the cam will have arrived at the horizontal, that is, would be in the same horizontal line with the pendulum pivot designated D?

Same objection.

A. It would apparently clear the used part of the cam, as shown in Fig. 4. I am of the opinion, however, that if the cam were drawn on a large scale according to the disclosure in column 2 on page 2, the tape would not be tangent to the surface of the cam on the horizontal line B A in Fig. 4.

By Mr. Davis: Copies of the DeVilbiss and Jensen patents are offered in evidence, and the notary is requested to mark the same

"Defendas's Exhibit DeVilbiss Patent Re. 12, 137" and "Defendant's Exhibit Jensen Patent."

By Mr. Richmond: The foregoing exhibits are objected to as irrelevant and immaterial to the direct examination and to the issues in controversy.

XQ. 38. Can you suggest any other reason than the one given in the Jensen patent for resorting to the cam or eccentric and band as a form of operating connection between a pendulum and load-supporting means in a weighing scale, in place of a crank arm and link?

Objected to as irrelevant with respect to the direct examination and the issues in controversy, and as calling for opinion testimony outside the scope of the direct examination, and therefore incompetent.

A. I do not wish to speculate. I have already expressed the opinion that the Jensen construction is inoperative to produce a uniform scale.

XQ. 39. But you have also expressed the opinion, have you not, that the reasoning in the specification of the Jensen patent is correct as to the employment of a cam and band in place of a crank arm and lift for the purpose of equalizing graduations?

Same objection.

A. Assuming that the tape is tangent to the cam on the horizontal line A B in Fig. 4, Jensen's reasoning is correct.

Cross-examination closed.

ARTHUR F. POOLE.

Adjourned subject to further notice.

I, Annie C. Courtenay, a Notary Public in and for the County of Cook, in the State of Illinois, and Special Examiner by agreement, hereby certify that all the proceedings aforesaid were had as stated in the cause named in the caption hereto; that on the 20th day of February, 1912, and subsequent days mentioned in the foregoing deposition, I was attended by Mr. Carl A. Richmond, counsel for complainant, and Mr. Frank P. Davis, counsel for defendant, and by the witness, Mr. Arthur Poole; that before giving his deposition the said witness was by me duly sworn to testify the truth, the whole truth, and nothing but the truth in said cause, and that his deposition was taken down by me in typewriting from his statements and afterwards read over and subscribed by him as and for his deposition in said cause; and that I am not related to or of counsel for either of said parties, or in any way interested in the result of said suit.

In testimony whereof I have hereunto set my hand and affixed my notarial seal this 5th day of March, A. D. 1912.

ANNIE C. COURTENAY,
Notary Public.

(Seal)

UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company,
vs.
Toledo Computing Scale Company.
} In Equity. No. 30,024.

NOTICE.

To Messrs. Rector, Hibben, Davis & Macauley, McCormick Building, Chicago, Illinois.

Gentlemen:

You are hereby notified that we shall resume the introduction of proofs on behalf of complainant in the above entitled cause, under the 67th Equity Rule as amended and the statutes in such case made and provided, and in accordance with the stipulation hereinbefore entered into between the parties to the above cause by their counsel, before Albert Garceau, Esq., Notary Public, or other competent official, at the office of Thomas A. Mullen, Esq., 15 State Street, Boston, Massachusetts, beginning at 2 o'clock in the afternoon, Thursday, March 14, 1912. Witnesses to be examined are Daniel P. Sullivan, William G. Bell, and Daniel J. Moynihan, Jr., all residents of Boston, Massachusetts, and perhaps others. You are invited to attend.

SHERIDAN, WILKINSON, SCOTT & RICHMOND,
Solicitors for Complainant.

Chicago, March 6, 1912.

Service of the above notice acknowledged this 6th day of March, 1912.

RECTOR, HIBBEN, DAVIS & MACAULEY,
Solicitors for Defendant.

UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company,
vs.
Toledo Computing Scale Company.
} In Equity. No. 30,024.

Testimony in rebuttal taken on behalf of complainant, pursuant to the Statutes and Equity Rules, before Albert Garceau, a Notary Public, acting as Special Examiner by consent, at the offices of Thomas A. Mullen, No. 15 State Street, Boston, Mass., Thursday, March 14, 1912, at two o'clock, pursuant to notice and agreement of counsel.

Present:

Carl A. Richmond, Esq., for complainant.

Frank P. Davis, Esq., for defendant.

An adjournment is taken until ten o'clock A. M., March 15, 1912.

Met pursuant to adjournment. Present as before.

DANIEL J. MOYNIHAN, JR., a witness produced, sworn and examined on the part of complainant, deposes and testifies as follows in answer to questions by Mr. Richmond:

Q. 1. Please state your name, age, residence and occupation?

A. Daniel J. Moynihan, Jr.,; 40; No. 356 Broadway, South Boston; general Eastern manager, Moneyweight Scale Company.

Q. 2. How long have you been employed by the Moneyweight Scale Company?

A. Three years and eight months.

Q. 3. What was your employment previous to that?

A. Deputy sealer of weights and measures for Boston; previous to that as a machinist for nine years.

Q. 4. What was the date when you commenced your em-

ployment in the Department of Weights and Measures in Boston?

A. May 1, 1896.

Q. 5. What were your duties as a deputy sealer?

A. The duties of testing, adjusting, condemning, or sealing of weighing and measuring devices in use in the City of Boston.

Q. 6. When you began your work as a deputy sealer in Boston, and within a few years thereafter, did you ever have occasion to test any automatic computing scales, and if so how early did you run across them?

A. Very early after my appointment I did test computing devices of an automatic nature, the latter part of 1896 and in 1897, and from that time on during my entire incumbency in the sealer's office.

Q. 7. Please describe in a brief outline way the automatic computing weighing scales that you tested in the years 1896 and 1897, as you have just stated.

A. It was the hanging, spring type of automatic computing scale, with the chart enclosed in a casket or drum made of tin or sheet metal, with an opening all the way across on what was known as the merchant's side of the scale, exposing the weight and value figures which appear for an inch or more at a time across the front portion of the scale and with a small opening in the rear of the drum or casket covering, which exposed the weight on the customer's side of the scale.

Q. 8. What was the shape of the chart within this casket or drum?

A. It was a cylindrical chart attached to spiders which formed the drum shape.

Q. 9. Where were the springs in this scale?

A. On each end of the scale; they worked in unison with racks and pinions, which constituted the mechanical features that operated the chart as it revolved on its spindle.

Q. 10. Do you remember what this type of scale was called, or who were spoken of as the manufacturers of it at this time you first became familiar with it?

A. It was customary to refer to it as the "new computing scale" or "Boston Butcher Scale," and it was my belief at that time that it was sold by the W. G. Bell Company, of Boston.

Q. 11. Did you know of any other types of automatic computing scales in use in Boston in the years 1896 and 1897?

A. No, sir, I didn't.

Q. 12. In these scales that we have been speaking of, what was the relation of the two openings through which the merchant and the customer read the weights?

A. Well, as the correctness of weight appeared to the merchant on his side of the scale, the same exact weight was exposed on the customer's side on an inverse scale, which worked in connection with the customer's scale, there being two weight scales on the chart.

Q. 13. On what part of the chart were these two weight scales?

A. In the center of the chart.

Q. 14. And you mean that the sight openings were so placed that the merchant read on one of these two scales and the customer on the other?

A. Yes, whenever a weight was placed upon the scale that weight was correctly indicated on both the customer's and the merchant's scale.

Q. 15. Please tell what qualities you tested these scales for, and how you made these tests, and with what results.

A. We tested for the correctness of weight, where indicated, for the sensitiveness and accuracy of the device itself; the test was applied by the use of the authorized standards of Massachusetts, and in the case of a scale of this nature would have been avoirdupois pounds and ounces. These scales were found to comply with our standards, and meeting the qualifications required by law for weight, which was all that we tested for at that time, were sealed by our department of weights and measures.

Q. 16. Have scales of the same type continued in use here in Boston down to the present time, and if so, can you give us some idea of the extent of such use?

A. Yes, the same general character of scales have continued in use; there have been some improvements, some change made in the appearance, but the same general principle has been followed so far as the mechanical features of operation for that type of scale are concerned. The amount or number of such scales in use I can only speak of in a general way. My experience and acquaintance with this particular district would warrant my saying that over 70 per cent. of all automatic computing devices in use in Boston are of this type.

Q. 17. In order that we may understand clearly, I will

ask you to explain at this point just what you mean by "this type," which you referred to in the foregoing answer.

A. A type of scale, as I expressed it, represents the general principle involved in the operation of the scale itself. The automatic feature operated by springs at either end of the scale, with racks and pinion gears on either end of the spindle, to which the chart and drum is attached; the entire chart and drum spindle at either end resting in ball bearings, constitutes the general type or character of that automatic scale. A pan hanging from this particular scale, or this particular scale being attached to a platform resting upon levers only make it another style of that general type of scale, but those features which make for correctness of weight and accuracy and sensitiveness are followed in accordance with the original principle. The changes referred to in my previous answer were the putting of air chambers or tubes inside the drum rather than having them on the outside, as it was an old scale, and the change in the improvements made on the thermostat, the addition of name-plates, but none of which changes change the type.

Q. 18. Were there any other makes of automatic computing scales in use in Boston, so far as you knew, in the years 1896 and 1897, aside from this "Boston Butcher Scale"?

Objected to as having been previously asked and answered. See Q. 11 and answer thereto.

A. No, sir.

Q. 19. As nearly as you can recall, about when did other makes come into use in Boston?

A. Automatics? My first experience with any other type was in 1899. There was an automatic scale known as "the automatic." It was a scale having a perpendicular chart, working in a perpendicular casket, with sight openings on either side of the casket. That was the first automatic, aside from the Boston Butcher type, that I recall as an automatic computing scale. In 1905 or 1906, and I place the date because of the convention of sealers in Massachusetts, I became acquainted with an automatic scale called the "Toledo." There was at about the same time a Kansas City computing scale, a few of which I saw in Boston. Later I saw the "Standard Automatic Computing Scale," and the "Stimson Automatic Computing Scale," the "Angledile Automatic Computing" and the "Anderson Automatic Computing."

Q. 20. What other types of charts are there among these automatic computing scales besides the rotary drum chart?

A. There is a fan type of chart, and the dial type of chart. There is the cylinder roll, which is manually operated and attached to scales used in connection with beams and counterpoises. These beams are indicating beams for weight only. Also reversible card charts on platform types, used with the aid of sliding poises.

Q. 21. Which of these types of charts which you have just enumerated are automatic or go to make an automatic scale?

A. None of them, I should say, go to make an automatic computing scale. There are none of them that would make an automatic computing scale. The fan type would be automatic for its own capacity. In other words, on a thirty-pound scale if there appeared a ten-pound chart the chart would give an automatic reading for ten pounds. Then it would be necessary to use weights or counterpoises to increase the capacity of that scale for weighing purposes.

(No. Q. 22.)

Q. 23. So far as you know, will you please state who succeeded to the interests of the W. G. Bell Company in the sale of scales of the type of the Boston Butcher scale?

A. I know the Dayton did, the Computing Scale Company of Dayton, Ohio, but I was not familiar with the time when such possession was granted to the Dayton Company, nor do I know at the present time just when it took place, for the type was known always to the sealers as the Boston Butcher scale, up to 1905 or 1906.

Q. 24. By what name or names have those scales been known since 1905 or 1906?

A. As the Dayton Boston Butcher scale, there being other types in use, to merely distinguish them. If my memory serves me correctly, no distinction was made up to that time or up to the time I severed my connection with the department of weights and measures, as between the types of computing scales when reporting work performed upon same.

Q. 25. What party sells scales of the type of the Boston Butcher scale now?

A. The Moneyweight Scale Company of Chicago, and its many agencies.

Q. 26. How severe or exacting were the requirements of the Boston Department of Weights and Measures when you were connected with it, with respect to testing scales for weighing?

A. I can only speak for myself and instructions that I worked under. I always attempted to apply a test for correctness, making due allowance for the character of weighing or weighings to be made over the particular device or scale I was testing. A closer or greater degree of accuracy would be expected to obtain over fine weighing scales, such as would be used by apothecaries, jewelers, or diamond sellers than those used in a meat market or a grocery store, and greater accuracy would be expected, and scales would be tested accordingly, for grocers or butchers use than on dormant scales used in a junk store, or on wagon scales or coal scales. But at all times it was necessary in making such tests that scales be so constructed as to meet the tests with approximate accuracy.

Q. 27. Please give us a general statement as to the extent of use of automatic revolving drum computing scales sold by the Moneyweight Scale Company in this territory, at the present time.

A. This territory is represented by the Boston office of the Moneyweight Scale Company, who sell that type of scale for the entire New England section of the country, and it would be hard for me to state beyond my knowledge for the past three years or more, when 4,000 or more of such scales have been sold in this section.

Q. 28. Can you give us a general or rough idea of what proportion this volume of business bears to the business done in the same territory with the same class of weighing scales by other concerns?

A. Only in a general way, and not speaking for the past four years, but for computing scales in use generally in this territory based upon reports as submitted by the salesmen in the New England territory, I would say 70 per cent. or more of all scales in use of the computing type or style are of the Dayton manufacture.

Direct examination closed.

Cross-Examination by Mr. Davis.

XQ. 29. The business of the Moneyweight Scale Company, with which you are associated and have been for the past three years and eight months, is that of distributing the product or products of The Computing Scale Company of Dayton, Ohio, complainant in this case, is it not?

A. Yes, sir.

XQ. 30. Can you state in terms of measures of weights, as, for example, ounces or fractions of ounces, what degree of sensitiveness was required of such weighing scales as those handled by the Bell Company during the years 1896 and 1897, under the laws or rules and regulations in force at that time in the territory where you were officiating as a sealer of weights and measures?

A. We would allow, I would allow, for about one-quarter of an ounce of the capacity of a twenty-four pound scale.

XQ. 31. Did your duties as a sealer require you to examine the interior construction of such scales?

A. It didn't require that we examine into any scales only in so far as the part of the duties of a sealer under our law was to make such adjustment as we could conveniently make in order to make the scale conform to our standards, and in making such adjustments we were afforded an opportunity of examining into the general character of the operating mechanism of all scales.

XQ. 32. Did this extend to the examination of mechanism that would not be accessible without removal of inclosing casings or portions thereof?

A. Yes, sir, it became necessary for us to remove casings or attachments in order that we could get to the mechanical features which operated the scale to make such adjustment.

XQ. 33. Can you state what the particular interior construction was in those Boston Butcher scales of the hanging type which were marketed by the Bell Company during the years 1896 and 1897?

A. As I recall, it was the air tubes or chambers contained inside the shield which was on the outside at either end of the drum, in which a plunger, attached to a bar beneath, were used for purposes of regulating or checking oscillation or vibration. After removing two sections of coverings or caps on either end of the scale, the mechanism inside was coiled spring, rack bars, pinion gears attached to the spindle, ball bearings set inside the chamber on either end, on which the spindle rested, and spiders, of which there were three, on which was mounted the chart.

XQ. 34. Do you recall the means by which the chart was fastened to those spiders in said scales?

A. I couldn't state positively just the manner in which they were attached at that time.

XQ. 35. Having reference to the matter of adjustments, which you have stated the sealers of that period were in the

habit of making in connection with their work of inspecting and sealing scales of the type in question, do you recall whether or not the cylinders of those scales were equipped with means for adjusting to balance the cylinder, as, for example, by small weights, movable upon the arms of the spiders?

A. No, sir, as I recall, we made adjustments at that time with the use of a small light wire, which was wound around and attached to the spider arm itself at the proper place to make the necessary adjustments.

XQ. 36. Do you recall whether these wires that you speak of also served as the means for securing the chart to the spiders?

A. No, the wire we used in adjusting was the wire furnished by the sealer's office, and we carried it around as a part of our equipment. I cannot positively state just how those charts were attached to the spider.

XQ. 37. Did those Bell Company scales that you inspected and sealed in the years 1896 and 1897 have thermostatic equipments?

A. There was a double bar arrangement, as I recall them, and I am not positive whether they were thermostats or intended to be used as thermostats.

XQ. 38. The thermostatic equipment to which you have referred in your direct testimony as employed upon this type of scale is for the purpose, is it, of compensating for variations in weighing, which would otherwise occur, due to changes in temperature affecting the springs that constitute the weighing medium?

A. Yes, sir, the thermostat referred to by me in connection with improvements made on that type of scale does serve just such a purpose.

XQ. 39. Was the dial type of scale, to which you referred in answer to Q. 20 also a hanging spring scale?

A. Yes, sir.

XQ. 40. Wasn't it automatic in the same sense that the hanging drum scale or Boston Butcher scale was automatic?

A. It was automatic to its capacity, but not in the same way that the Boston Butcher was. It was a clock dial-shaped chart, and the Boston Butcher was a cylinder drum-shaped chart. The hanging dial scale had a perpendicular reading furnished the merchant, while the Boston Butcher had a horizontal reading.

XQ. 41. The merchants's reading on the dial scale was done from the opposite side from that where the customer could get his reading, was it?

A. Yes, sir.

XQ. 42. This dial type of scale preceded the drum type, did it not?

A. No, sir, not in my experience in Boston as a sealer.

XQ. 43. You referred in your direct examination to both the hanging type and the platform type of drum scale, and I will ask you now to state as near as you can the proportion between the two as marketed during the time you have been associated with the Moneyweight Scale Company.

A. I would say conservatively 60 per cent. has been of the platform style.

XQ. 44. By platform style do you refer to that type of scale in which a platform, scoop, or other form of goods receiver is mounted upon a lever and located forward of the indicating drum or cylinder, and the lever connects in rear of the platform with the rack or racks that engage the pinion or pinions on the drum or cylinder spindle?

A. The platform style referred to by me is where the platform, as outlined by you, is connected by means of a steelyard hook, or connecting rod, with the operating mechanism of the scale above.

XQ. 45. You do not mean by this a platform or pan that is suspended under the drum, as in the so-called hanging type of scale, do you?

A. No, sir. The platform of such style of scale I refer to as being one such as you describe, having certain mechanical advantages furnished by the use of levers, to which a platform or scoop, or some type or kind of receiver was attached, and the platform with the levers is connected with the mechanical operation of the scale above by the use of a steelyard hook or rod.

XQ. 46. Do you remember what sort of an index or pointer was employed in those Boston Butcher scales of 1896 and 1897 to denote the weight indication upon the drum or cylinder and opposite sides thereof?

A. As I recall it at this time it was an arrow or pointer, perhaps an inch long, which pointed directly at the indicated weight which was upon the scale, and under which the zero would rest centrally when there was no load upon the scale itself. A similar pointer or arrow appeared on the

customer's side of the scale. This was either painted or a piece of metal attached in its proper place to serve as an indicator.

Adjourned until 2 o'clock.

Met pursuant to adjournment.

Deposition closed.

DANIEL J. MOYNIHAN, JR.

DANIEL P. SULLIVAN, a witness produced, sworn and examined on the part of complainant, testifies as follows, in answer to questions by Mr. Richmond:

Q. 1. Please state your name, age, residence and occupation?

A. Daniel P. Sullivan; 62; No. 4 Florida Street, Dorchester Centre, Massachusetts; paper, paper stock, paper maker's supplies; No. 9 Globe Building, Boston.

Q. 2. What was your employment in the years 1896 and 1897?

A. In 1896 I was deputy sealer of weights and measures, and in the year 1897 I was appointed sealer of weights and measures in Boston, and remained sealer until May 1, 1900; I had been a deputy sealer for nineteen years.

Q. 3. During your connection with the office of sealer of weights and measures in Boston in the different capacities that you have just stated, did your office ever have occasion to test automatic revolving drum computing scales, and if so, please tell when they first came to your attention, as nearly as you can recall?

A. My first recollection of the computing scale was in the year 1897; one of our Boston merchants, William G. Bell, came to the office and brought to the office a computing scale. I had known Mr. Bell for years, and I gave instructions to the deputies at that time to be very careful when making a test of these scales, to disregard the computation, and test the scale for its accuracy as an avoirdupois scale, testing the same with the standard weights from zero to its full capacity.

Q. 4. What did you call these scales?

A. They were known at that time, the scale that Mr. Bell had, as the Boston Butcher scale, a hanging scale, spring scale, with a pan, and we called them, when entering them

on the record books, spring balances. We made no distinction, whether it was a computing scale or a hand spring-balance.

Q. 5. Prior to the introduction of these Boston Butcher scales in Boston, were there any other computing scales in use?

A. I don't recall any of them at that time.

Q. 6. Would you have been likely to know if there had been others?

A. The department was supposed to anuually test and seal all scales, weights and measures used for the purpose of buying or selling merchandise.

Q. 7. So far as you recall, when was the next automatic computing scale put on the market after this Boston Butcher scale?

A. I think the next scale that I saw that was automatic was the scale that had a perpendicular barrel, with a pan attached, while the Boston Butcher scale was suspended horizontally, set in horizontal position, with pan attached.

Q. 8. About when did you first have knowledge of this next scale?

A. Well, I think it was about 1899, about a year and a half or two years after the introduction of the scale which Mr. Bell had.

Q. 9. Can you give us a statement that will give us some idea of the extent to which these Boston Butcher scales were introduced and used?

A. Well, they came along pretty fast in 1898 and 1899. I think about the latter year there was a store opened on the corner of Bedford and Summer street, if I remember right, where these computing scales were sold, and it was said that Mr. Bell had sold his interest in this Boston Butcher scale, automatic computing scale, to a company known as the Dayton Scale Company.

Q. 10. During those first few years when the Boston Butcher scale was being introduced and used here in Boston, what kind of results did your department get from the tests which you made of those scales?

A. Well, they were quite satisfactory. As I stated before, we simply tested the scale for its accuracy as an avoirdupois scale, from zero to its full capacity; in some cases there were slight variations in weight and when found, the customary tag of condemnation was applied, which the laws

of Massachusetts require to be placed upon a scale found to be inaccurate; there was a statement written on said tag showing at what points the variation in the scale existed. The owner of the scale would then take the scale to the dealer from which he bought the same, and have the scale adjusted at the points where variation existed. He would then bring the scale back to the sealer's office, have it re-tested, and if found correct, the tag was removed, the scale sealed, and a record made of the same.

Q. 11. Please describe in a brief general way the construction and mode of operation of these Boston Butcher scales.

A. The scale was known as the type of a hanging, spring-balance, the mechanism of the scale covered by a cylindrical drum, springs on both ends of the scale, also enclosed; the reading of the scale was read by ounces from zero to the capacity of the scale, I have forgotten, I think about twenty pounds.

Q. 12. How was the drum operated in these scales?

A. The drum was very light in construction and was covered with a paper chart. The figures showing the pounds and ounces in weight reading from the front, also the computation, while on the back of the scale, where the purchaser would read, was a kind of a panel, about 2 inches, 2½ inches, in length, showing pounds and ounces for two or three pounds, that is, showing the weight of the article purchased, no figures of computation visible on that side.

Q. 13. What was the mechanical connection for operating this drum?

A. Well, as I remember it, there was a spindle passed through the center of the drum. I am not clear on the mechanical device on the end of it, it is so long since I have seen one; while it was not the business of the sealer to take the scale apart for the purpose of testing the same, I remember that the drum was of a very light construction, very sensitive, so sensitive that when loaded to its full capacity, the placing of a quarter ounce weight on the scale in addition to that, the same was perceptible. That was done for the purpose of indicating the sensitiveness of the scale.

Q. 14. How was the chart arranged so that the merchant and the customer, standing on opposite sides of the device, could both read the weight?

A. Well, it was an inverse scale.

Q. 15. Please describe a little more fully what you mean by this, if you recall.

A. The chart on the side with the merchant had the automatic computation running to a various scale of prices, and an avoirdupois weighing chart, and the avoirdupois weights as shown on the merchant's side would also be shown on the other side of the chart, so that the customer might read, but at no time could he see the computation.

Q. 16. Did the customer and the merchant get their readings from the same pound and ounce scale, or from different pound and ounce scales?

A. Well, the chart, as I understood it, read one way on one side and the same on the other side for the customer.

Q. 17. Did this type of scale continue in use until the time you left the sealer's office?

A. Yes, they came along, came along quite rapidly, at first they experienced some difficulty from lack of proper knowledge of adjusting at that time, but as they were used and the dealer became more familiar with the scale, they acquired a better knowledge of adjustment, and we rarely found a scale, after they were a few months on the market, but what would seal.

Q. 18. When your department ran across one of these scales that was at all inaccurate in any part, did that render the scale absolutely useless, or could the difficulty be overcome?

A. Where any serious inaccuracy would require the placing of a condemnation tag on the scale we would request the owner to have the same adjusted so that the scale might be sealed.

Direct examination closed.

Cross-Examination by Mr. Davis.

XQ. 19. Do you recall what caused the inaccuracy of any of these scales, about which you have been testifying, which inaccuracy required the application of a condemnation tag; what caused the inaccuracy?

A. Well, that was something that it would be hard to say. It would be hard to answer unless in the case where the barrel rubbed at some point. One acquainted with the workings of sensitive scales could readily see that there was some friction somewhere, at some part, on the drum it could be easily noticed, as the scale would act sluggish, and one

familiar with the workings of scales would see at once wherein the difficulty lay. In our opinion, if it was in the spring it would show a variation at different points on the scale. It might vary at three pounds and be right for ten pounds, while at another point it would be wrong, and we would notify the owner of the scale and he would have it adjusted.

XQ. 20. When inaccuracies such as you speak of were observed in the testing of the scales, the sealer undertook to determine what caused the inaccuracy, did he, and inform the user?

A. If possible.

XQ. 21. This rubbing of the barrel, to which you referred, would be a rubbing against the inclosing casing or cylinder, would it?

A. It would.

XQ. 22. During the time when you were officiating as deputy sealer, or during subsequent years when you were sealer, did you have occasion yourself to personally inspect and seal any of the scales of this particular type, that is, the type which employed the revolving drum or barrel, with the suspended pan?

A. Yes, sir.

XQ. 23. Did you have occasion in such connection to familiarize yourself with the interior construction of the scale, by which I mean the working part that would not be visible without removing the inclosing casing, or a portion thereof?

A. It was not the duty, no part of the sealer's duty, to strip the scale to examine the interior mechanism of the same, or attempt to make any adjustment further than to see that the scale was properly balanced before tested.

XQ. 24. That is, inspection concerned only the exterior of the scale to see what results would show under the testing by the use of weights?

A. Yes, by the use of weights. There were times, of course, when the interior mechanism of a scale would be examined, but no attempt made to make any adjustment. The scale being a new one, it was supposed to be a correct scale when sold, and the duty of the dealer to furnish the merchant with an accurate scale.

XQ. 25. Did your examination of those scales that came under your notice during the years 1896 and 1897 so far acquaint you with the particulars of their construction as to enable you to now state from memory just how the barrel or drum was made up and mounted to revolve?

A. I should not want to say that I could go into details about the construction of the drum, only on general principles of its suspension.

XQ. 26. How sensitive were the scales of such a character required to be to authorize the sealing of them at this period?

A. To be absolutely right at every notch from zero to the capacity of the scale.

XQ. 27. How much of a variation, expressed in terms of weight, would have been permissible for a scale of the type in question under the regulations then in force?

A. When a new scale was brought to the office for examination by the merchant, the department would always insist upon the absolute accuracy of the scale to its full capacity on counter scales and spring scales.

XQ. 28. Would the scale at that period have been passed and sealed if, under the same load, it could be made to vary in its indication to the extent of a half an ounce?

A. A half an ounce would have no indication, and it would greatly depend at what weight the variation of half an ounce existed. Were it on the first pound, or the popular weight, smaller weights, two, three or four pounds, no; while at twenty pounds, or nineteen pounds, or nineteen and a half pounds, if the scale came within half an ounce it might go, as the scale was intended to weigh not less than one ounce.

XQ. 29. Would you say the same as to the variation of a quarter of an ounce?

A. Well, a quarter of an ounce is a very small space on the indicator of a scale, dividing the ounce space in four parts, it would be scarcely perceptible.

XQ. 30. Do you remember what sort of an index or pointer those scales that the Bell Company marketed had upon them to denote to the merchant and to the customer the weight of the commodity?

A. I think there was an indicator.

XQ. 31. Do you remember the form of the indicator?

A. I have forgotten whether it was an arrow point or a heavy line.

XQ. 32. Do you remember whether this type of scale, with the barrel or drum, when it "came along pretty fast," as stated by you, in 1898 and 1899, contained any variations in construction in any particulars as compared with the similar scales that had been marketed by the Bell Company in 1896 and 1897?

A. Well, the scales appeared to be more sensitive in the

latter years, the manufacturer having noticed some of the earlier objections to the scale, and seemed to make a general improvement in the working of the scale.

XQ. 33. Do you remember what the differences in construction were that rendered the scales of 1898 or 1899 more sensitive than those of 1896 or 1897?

A. Well, they had a thermostat, a bar under the barrel of the scale, covered what they called a thermostat. It was claimed that it would be a great improvement upon the old type of spring scales, I don't say automatic spring scales, that the scale would not be likely to be affected by change of temperature, whether used in the store or upon the sidewalk, as scales are in many places.

XQ. 34. Do you remember changes in the particular construction of the barrel or drum, or the mounting thereof, in the scales of 1898 or 1899, as compared with those of the earlier years?

A. Well, as I said before, Mr. Bell at that time noted many of the little things that caused inaccuracies in scales and seemed to make improvements by a little better finish, as the general sensitiveness of the scale seemed to improve right along, which I attributed to their selling the goods and having a market for the scale, so they were enabled to spend more time on the scales and give a better article.

XQ. 35. Do you remember whether in the sales of 1898 or 1899 the difficulty caused by the rubbing of the barrel or drum against the casing had been overcome?

A. I think it had; it was very seldom found at that date.

XQ. 36. Do you know where Mr. Bell got those scales; that is, who was manufacturing them?

A. No, I have heard that he got hold of a patent and was furnishing the money to manufacture, and later sold his interest in the patents and assigned his patents to the Dayton Scale Company.

XQ. 37. Do you know where those scales that Mr. Bell handled were manufactured?

A. No, sir, I do not. I have heard that they were manufactured in Connecticut, the town I couldn't say, and heard later when Bell had sold his interest, and that the factory had gone west to Dayton. The name of the town I couldn't mention.

XQ. 38. Do you recall inaccuracies or non-uniform weighings on those scales of 1896 or 1897, as being found to be due to the barrel or drum not balancing properly in its bear-

ings, by reason of non-uniform distribution of weight of the barrel or drum about its center of rotation?

A. With the scale properly balanced, the barrel working free, no friction visible, defects in weight would be attributed to variation of defective spring. The scale might show accurate from one to five pounds, and from five to ten pounds show a variation. In such cases it would be attributed to defects of spring.

XQ. 39. Do you remember just how the paper chart in any of the scales, either those of 1898 or 1899, or those of 1896 or 1897, was secured in place upon the barrel or drum?

A. No, I can't say that I do.

XQ. 40. Do you remember what sort of bearings the barrel or drum turned in?

A. No, not to describe, that I could describe thoroughly.

Cross-examination closed.

Redirect Examination by Mr. Richmond.

RDQ. 41. You have stated that in some instances your office found Boston Butcher scales to be slightly inaccurate at certain points, and required them to be readjusted before sealing; how did your practice in these cases compare with your practice for spring scales in general?

A. With the old-fashioned spring balance, the Chatelaine and Forschener balance, those makes being predominant in the Boston market, if the scale were a new one, tested for the first time, and coming direct from the scale dealer, no attempt would be made by the sealer to adjust the scale. The owner would be requested to take the scale back, after the condemnation tag had been placed upon it, and have the same adjusted. With an old scale, one that had been in use some years, if out of balance, the hand was removed from the scale and set backward or forward, as the case required, so that the scale would be balanced properly before applying the test weight. And then, if found wrong, the scale would be condemned.

RDQ. 42. When were these Chatelaine and Forschener scales in use?

A. They had been in the Boston market for forty years, I should say, thirty-five years, to my knowledge.

Redirect examination closed;

Recross Examination by Mr. Davis.

RXQ. 43. In any of those instances you have referred to where the Boston Butcher scales were tagged with the condemnation tag, and later brought back for reinspection, do you remember taking note of just what change or changes had been made in them for the purpose of curing the inaccuracies or defects that had caused the placing of the tags upon them?

A. I don't, unless the case was one where the scale rubbed, the barrel rubbed, in a case of that kind we would note that the defects had been removed, but if any other adjustment was made, we would presume it was made upon the spring.

RXQ. 44. In those cases where the trouble arose through rubbing of the barrel or drum against the casing, do you remember what expedients were resorted to for the purpose of curing this difficulty?

A. No, I can't exactly recall; in some instances Mr. Bell personally came to the office and made some slight adjustment himself, by the taking off or putting on of small sheets of metal, as he thought the scale might require to make the scale accurate. That rarely happened that any adjustment was made at the sealer's office by the scale dealer.

RXQ. 44a. Do you remember whether those small pieces of metal were employed for the purpose of securing the paper chart in place?

A. I can't say that I ever noticed a case where they had any trouble with the paper chart, other than by some interior disarrangement, where a slight rub might have taken place, which would at once be perceptible when the test weights were applied.

RXQ. 44b. You don't remember, then, just what those small pieces of metal that Mr. Bell put on or took off were used for?

A. No, I take it that he attempted to make an adjustment which did not work the same on all scales in which the sealer found variations. He was not a practical scale maker. For that reason I never considered that his knowledge of adjustment of the scale was very extended.

RXQ. 44c. Do you recall whether such small pieces of metal were put upon or taken off of the barrel or drum in such a manner as to affect the distribution of weight around

the center of rotation of the drum, or with that evident purpose in view?

A. Well, I can't say that I paid much attention to any of the attempts made to adjust that type of scale.

RXQ. 45. Do you remember the use of wire wrapped around the spokes of the barrel or drum as an expedient for attaining a proper distribution of weight?

A. I think there was some cases, I could not say whether it was in the early stages of the introduction of the scale or in the latter scale when they began to run smoother. I think they had some small wires that they used for adjustment, that they placed on the spring at the edge of the barrel.

RXQ. 46. Do you remember whether such wire was also employed in those Boston Butcher scales for fastening the paper charts onto the drum?

A. No, I do not.

Recross examination closed.

Re-redirect Examination by Mr. Richmond.

RRDQ. 47. Can you give us an estimate of the extent to which you found it necessary to have adjustments made in the Boston Butcher scales before sealing them?

A. Well, when the scale was first introduced, and it being a new type of scale, having the computation feature, as well as pound and ounce, the department exercised great care in testing the scales and studiously avoided conflict with the scale maker, never criticising his automatic device, but always insisted upon absolute accuracy of the weighing machine before sealing. The percentage of errors in new scales brought to the office was small.

RRDQ. 48. What was Mr. Bell's line of business at the time he began handling these scales?

A. Mr. Bell was a wholesale dealer in provisions, mainly pork products, and had quite a number of Buffalo scales, which he purchased from that company after they closed their Boston office. He continued selling the Buffalo scale until the time that he introduced the Boston Butcher scale.

RRDQ. 49. Did he give his entire attention to handling the Boston Butcher scale, or was it an extra or side line?

A. He continued it as a side line, with his other business, but seemed to be very determined in the advancing of the interests of the Boston Computing scale.

Re-redirect examination closed.

Re-recross Examination by Mr. Davis.

RRXQ. 50. Is the Mr. Bell that you have referred to in your testimony now living, and if so, what is his present address, if you know?

A. Well, William G. Bell, who introduced the first automatic scale in Boston that I saw, is in business in Boston, at the corner of Commercial and Richmond streets, this city. He sells scales, market hardware, butchers' hardware, and other lines that he has operated for years.

Deposition closed.

DANIEL P. SULLIVAN.

By Mr. Richmond: Counsel for complainant offers in evidence a certified copy of the file-wrapper and contents of the United States letters patent No. 839,736, granted December 25, 1906, to Allen DeVilbiss, Jr., assignor, and asks the Examiner to label it "Complainant's Exhibit Certified Copy File-Wrapper and Contents DeVilbiss Patent 839,736."

By Mr. Davis: The offer and receipt in evidence of the aforesaid alleged exhibit is objected to as immaterial, irrelevant and incompetent, particularly as no reference has heretofore been made thereto in any portion of the record thus far adduced in this cause, nor anything put upon the record to indicate in any manner wherein the said alleged exhibit is supposed to have any materiality or relevancy to any issue in the cause.

By Mr. Richmond: The exhibit is offered as an admission by the defendant or its privies, and in this connection attention is directed to the last paragraph of the "Remarks" in the paper No. 2 filed May 10, 1901.

Adjourned subject to further notice.

Commonwealth of Massachusetts, } ss.
Suffolk, }

I, ALBERT GARCEAU, a Notary Public in and for said County and Commonwealth, duly commissioned and qualified, and authorized to administer oaths and to take and certify depositions, do hereby certify that, pursuant to the annexed motion issued and served in the civil cause depending in the district court of the United States for the Northern District of Illinois, wherein The Computing Scale Company is plaintiff and Toledo Computing Scale Company defend-

ant, I was attended at the office of Thomas A. Mullen, No. 15 State Street, in Boston, by Carl A. Richmond, counsel for said plaintiff, and also by Frank P. Davis, counsel for defendant, on the several days and dates hereinbefore stated; that the aforenamed witnesses, Daniel J. Moynihan, Jr., and Daniel P. Sullivan, who were of sound mind and lawful age, and were by me first carefully examined and cautioned and duly sworn to testify the truth, the whole truth and nothing but the truth, and they thereupon testified as is above shown, and that the depositions by them subscribed, as above set forth, were reduced to typewriting by Helen M. McDermott, under my personal supervision, in the presence of the witnesses themselves, and from the statements of them, and were subscribed by the said witnesses in the presence, and were taken at the place in the annexed motion specified and at the times as set forth, adjournments being had or taken from day to day as provided for in said notice, and that all was so done, written and signed in the presence of said counsel for said plaintiff and defendant. I further certify that the reasons for taking the said depositions was, and is, and the fact was, and is, that all the deponents live at Boston, more than 100 miles from the place where the said civil issue is appointed by law to be tried; that I am neither of counsel nor attorney to either of the parties to said suit, nor interested in the event of said cause and that it being impractical for me to deliver said depositions and the exhibits thereto attested with my own hands into the court for which they were taken, I have retained the same for the purpose of being sealed up and directed with my own hand, and speedily and safely transmitted to the said court for which it was taken, and to remain under my seal until there opened.

As witness my hand and seal as such Special Examiner at Boston on this eighteenth day of March, 1912.

ALBERT GARCEAU,
Notary Public.

(Seal)

UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company
vs.
Toledo Computing Scale Company. } In Equity. No. 30,024.

Testimony in rebuttal taken on behalf of complainant, pursuant to the Statutes and Equity Rules, before Albert Garceau, a Notary Public, acting as Special Examiner, by consent, at the offices of Thomas A. Mullen, No. 15 State street, Boston, Mass., Saturday, March 13th, 1912, at 2 o'clock, pursuant to notice and agreement of counsel.

Present:

Carl A. Richmond, Esq., for complainant;
Frank P. Davis, Esq., for defendant.

WILLIAM G. BELL, a witness produced, sworn and examined on the part of complainant, deposes and testifies as follows, in answer to questions by Mr. Richmond:

Q. 1. Please state your name, age, residence and occupation.

A. William G. Bell; president of the William G. Bell Company, No. 50 Commercial street, Boston; born February 1st, '39.

Q. 2. What is the line of business of the William G. Bell Company?

A. Refrigerators and general store furnishings, including the manufacture of Bell's spiced seasoning and the manufacture of Bell's patent sausage bag.

Q. 3. How long have you been in business at the address that you have given?

A. Forty-three years. I began business in '61.

Q. 4. I call your attention to this assignment from the Boston Computing Scale Company to The Computing Scale Company, a stipulated copy of which is in evidence in this case, and ask you if you recognize your signature?

A. Yes, sir.

Q. 5. According to this assignment, the Boston Computing Scale Company was at one time the owner of reissue patent 11,536, to A. U. Smith, and patent No. 597,300, to the same party; will you please tell us the circumstances of the acquisition of these patents by the Boston Computing Scale Company?

A. There were in my employ two young men, namely, Allston Sargent and Charles Russell Luce. They had heard about this scale, which was being manufactured at Saugatuck, Connecticut, and unbeknown to me went there and bargained for the purchase of it. Afterwards Mr. Luce came to me, told me what they had done, said that his mother was opposed to his entering into the deal, as he would have to be away from home more or less, and he offered to transfer the business to me. I went with him to Saugatuck, Connecticut, investigated the scale, which up to that time I had never seen, and I secured—entered into some kind of a deal (I cannot tell you now just what), by which we became later on the owner of the patents and the good-will of the business.

Q. 6. Had the Boston Computing Scale Company been incorporated prior to this?

A. Oh, no.

Q. 7. For what purpose was it incorporated?

A. To take charge of the handling of this particular scale, or this scale manufactured by the Smiths at Saugatuck.

Q. 8. Did the Boston Computing Scale Company manufacture these scales?

A. No, sir; they were manufactured for us by the same parties that invented the scale.

Q. 9. About when was it that you entered into these business relations with the inventors and maufacturers of these scales?

A. It was early in the year 1897; I cannot give you just the dates.

Q. 10. Can you give us a general statement that will indicate the volume of business that you did with these scales from that time, early in 1897, until the date of the assignment to which we have just referred, namely, March 8th, 1899?

A. Well, judging from papers that I have examined, and my own recollection, I think we must have handled about 200 scales a month.

Q. 11. Have you any of those papers with you, and if so, please produce them and explain briefly their nature?

A. We have a box that has been undisturbed for eight or ten years, until very recently, and I simply took from the top of the box two or three memoranda, which I have here—I do not know whether they will be of any service to you—and the only statement that I found was this one here of bills rendered for different shipments from December 1st, to December 15th, 1897, and also another statement, pinned to the same, of scales shipped from December 13th to 31st. I found there were something more than 200 scales shipped during that time. I also have three memorandum bills in November, the month previous, practically the last two weeks in November; that is, during November 17th, 18th and 24th, in which there were shipped to us sixty scales in that time, a little more than a week's time. I have a receipt, it is the only one I found, dated April 21st, 1897, acknowledging the receipt of $375, which would represent about fifty scales, represents fifty scales at $7.50 apiece; it would represent the payment of fifty scales; it doesn't state so, but that is what it is. I also have a bill, dated March 15th, 1897, from the William G. Bell Company to the Boston Computing Scale Company, for thirty-three Acme scales, which was the scale that was represented by the Boston Computing Scale Company, billing same at $7.50 each. Originally the deal was made with William G. Bell and all goods shipped were charged to the William G. Bell Company, until some little time after the formation of the corporation known as the Boston Computing Scale Company, organized under the laws of the State of Massachusetts.

By Mr. Richmond: The documents referred to in the foregoing answer are now offered in evidence, and the Examiner is requested to designate them as follows:

"Complainant's Exhibit Smith Statements Against Boston Computing Scale Company, Dated December 15, 1897, and January 1st, 1898."

"Complainant's Exhibit Smith Memorandum Statements Against Boston Computing Scale Company, Dated November 17th, 18th and 24th, 1897."

"Complainant's Exhibit Receipt Issued by E. C. Smith Company, Dated April 21st, 1897."

"Complainant's Exhibit Bill of William G. Bell Company, Dated March 15th, 1897."

Q. 12. Do these documents enable you to make any more definite statement as to when you commenced this business with the Smith people?

A. I don't think so.

Q. 13. What is the earliest date that you can give from these documents?

A. There is nothing here to indicate. I looked up the matter yesterday in regard to the date.

Q. 14. I find that the bill from the William G. Bell Company against the Boston Computing Scale Company is dated March 15th, 1897. Was it before or after that that you began this business?

A. The Boston Computing Scale Company was interested from the very first. That is the paper that I formed my—that I got at my date yesterday.

Q. 15. Have you any recollection as to how many of these scales you handled altogether during the approximate period of two years that you engaged in this line of business?

A. I can only tell you my impression and the facts that are before us here. My impression is that we sold here in New England 1,500 scales, but whether that was the number of scales sold by the Boston Computing Scale Company, or the William G. Bell Company, or both together, I don't remember, and I cannot state. I would explain to you here that the William G. Bell Comapny handled them at the same time.

Q. 16. About how many of those scales had been made and sold by the Smith people before you entered into your relations with them?

A. I don't think very many. My impression is it was less than 100. In fact, I remember something about it; I think we began numbering ours at 200; theirs were 100, or less, as I remember.

Q. 17. Before you handled this scale had you handled any kind of scales for weighing?

A. Yes, sir; we had acted as agents for Henry Troemner, of Philadelphia, since 1892, up to two years ago.

Q. 18. Prior to handling this scale that we have been talking about, did you handle any computing scale?

A. Not that I remember.

Q. 19. Do you recollect any other computing scale as having been on the market here in Boston before you handled this Smith scale?

A. I have an indistinct recollection that the Dayton computing scale was offered to me at an earlier date than I was interested in this scale, and also some other computing scale that I don't remember the name of, but we didn't enter into the handling of them.

Q. 20. Do you remember any computing scale using a

chart as having been on the market in Boston before you handled the Smith scale?

A. My recollection is so indistinct that I wouldn't care to testify.

Q. 21. Were there other computing scales in active competition with this Smith scale here in Boston while you handled it?

A. Not to my knowledge; there was nothing similar.

Q. 22. Well, was there any kind of a computing scale that you can remember, that was sold in competition with this one?

A. Yes, sir, the Dayton, and I think there were one or two others, but not very much sale other than the Dayton scales.

Q. 23. Do you remember whether this Dayton scale had a chart or not?

A. I don't.

Q. 24. Have you handled any line of computing scales since you sold out to The Computing Scale Company of Dayton?

A. I handled a few of the Dayton scales, not very many.

Q. 25. Any others?

A. I sold two or three scales manufactured by Jones, of Binghampton.

Q. 26. Please state briefly what were your reasons for going out of this line of business and selling these patents to The Computing Scale Company of Dayton?

A. My principal reason was, that while my associate was a very pleasant fellow to meet outside of business, in business he was a source of annoyance, and being naturally of a nervous temperament, I felt it was better that I should sell than to continue in business with him. Socially, outside of the business, we were on very good terms.

Q. 27. Were you handling any other lines at the time you handled this Smith scale?

A. The Boston Computing Scale Company, no.

Q. 28. Were you handling any other line of goods whatever?

A. Personally, yes. I was the president of the William G. Bell Company, have been for twenty-one or twenty-two years, and we have always carried on a general merchandise business in grocers' and butchers' supplies.

Q. 29. So far as you are able to recollect, will you please describe the structure and mode of operation of this Smith scale?

A. I don't believe I could, understandingly. I didn't have much more to do than furnish the capital and have a general oversight of the business.

Q. 30. Are there any pictures on any of those statements or receipts that you have furnished that show this scale?

By Mr. Davis: Objected to as leading and suggestive.

A. It is represented on this bill, dated November 17, 1897. (Referring to "Complainant's Exhibit Smith Memorandum Statements Against Boston Computing Scale Company, Dated November 17th, 18th and 24th, 1897.")

Q. 31. By what name or names was this Smith scale known in Boston while you handled it?

A. I don't know of any other name than the Boston Computing Scale.

Q. 32. Please state in a brief way what was your experience with official sealers of weights and measures with regard to having this scale sealed.

A. I don't remember of having any difficulty with any of the sealers with regard to the sealing of it. I remember once going up to the old Court House, and in the basement calling on the sealers, but what my reason for going there was I cannot now remember.

Q. 33. Can you recollect any changes of construction that were made in these scales during the period when you handled them?

A. At first they were shipped to us, as I remember, with the outside casing made of aluminum, which corroded and proved unsatisfactory, and after a while we built the casings of copper, sheet copper, and some were nickel-plated, and others left in the polished brass.

Q. 34. Do you recollect how the chart was fastened to the frame on which it was mounted?

A. Pasted, as far as I can remember. Printed on heavy paper and then lapped and pasted.

Q. 35. Did these scales embody thermostats while you handled them?

A. I don't remember.

Q. 36. Were they all of the hanging, or were any of the platform type?

A. Hanging.

Direct examination closed.

Cross-Examination by Mr. Davis.

XQ. 37. Mr. Bell, do you know for how long a time the E. C. Smith Company had been engaged in the scale business prior to the time when you acquired the rights from it, with regard to the so-called Smith scale, about which you have testified?

A. I do not. I may have been told at the time. I presume I was, but I do not remember.

XQ. 38. Did you have any personal knowledge as to the doings of the Smith people in the scale business prior to the time that you obtained those rights from them?

A. I knew nothing about the scale in any way, shape or manner until I went on there.

XQ. 39. Then your first acquaintance with the so-called Boston scale was acquired in the early part of 1897, when you took up the business of selling in Boston; is that the fact?

A. Yes, sir.

XQ. 40. You have spoken of your connection with the business as that of supplying the capital?

A. Yes, sir.

XQ. 41. Who was the person, or who were the persons, associated with you that gave special attention to the handling of the scales; that is to say, the ordering of them and the soliciting for sales?

A. Mr. Charles R. Luce had the entire charge of the sales agency.

XQ. 42. Is this the gentleman you referred to as having certain characteristics which made him a source of annoyance to you in your business relations with him; is he the man?

A. Yes.

XQ. 43. Who else besides Mr. Luce participated in the business of procuring the scales from the Smith people and soliciting orders for them and distributing them?

A. He ordered the goods and arranged with the sales agencies for the selling of the goods.

XQ. 44. How great a territory did he operate?

A. Well, the whole of New England, and then we had a sales agency, as I remember, in New York for a short time, I don't know how long, and another one in Chicago.

XQ. 45. Were the goods distributed from your place of business here, or were they shipped direct from the Smith people's factory to places designated by you?

A. From papers that I was looking up today, I remember that they were shipped direct from the factory to Chicago, and also to New York, on orders that were received in that way. In other ways than that the New England trade was supplied from the office here.

XQ. 46. Who was the agent at Chicago; do you remember?

A. The Chicago office was operated by Sargent & Dempsey, general agents.

XQ. 47. And will you state who the agent was at New York during the short time you mention?

A. I cannot tell you.

XQ. 48. Did you yourself give sufficient attention to this scale business to thoroughly familiarize yourself with the particulars of construction of the scales?

A. No, I did not.

XQ. 49. Then you would not be able to state from personal knowledge just what the interior construction of those scales was?

A. I can see it in my mind's eye, but I couldn't—it was a round cylinder, that is, of strips; it was simply a skeleton frame, that is what I want to say—a skeleton frame covered with this thick, heavy paper.

XQ. 50. Did you inspect the structure to which you have just referred, comprising the skeleton frame and thick, heavy paper, closely enough during the time that you were in this scale business, to be able to state positively the exact manner in which the thick, heavy paper was fastened to the skeleton frame?

A. Only my impression, and I believe my impression is correct, that these strips were printed in long sheets and then one continuous strip wound around the frame, and with a sufficient space between the figures so it could lap over and be pasted.

XQ. 51. As to the pasting referred to, you mean the pasting together of the overlapped portion of this sheet of thick paper?

A. Yes, sir.

XQ. 52. Now, with reference to the manner of securing this pasted together piece of thick paper to the skeleton frame; did you so far familiarize yourself, then, with this particular feature as to be able to state now positively the particular manner in which that was done?

A. I wouldn't like to say that I did.

XQ. 53. Do you recall anything about the particular form and make-up of the skeleton frame to which you referred?

A. No, sir, I do not.

XQ. 54. You would not be able to state, then, whether or not that frame was supplied in those scales with any adjusting weights for the purpose of obtaining a proper balancing of the cylinder in its bearings?

A. I don't care to say that I do.

XQ. 55. Do you recollect what sort of index was used upon those scales for the purpose of denoting the weight when goods had been placed upon the pan?

A. Well, as I recollect, the weights were indicated in the center of the revolving cylinder.

XQ. 56. Do you recollect whether in those scales a metal pointer or finger projected from one side of an opening in the surrounding casing for the purpose of denoting the weight numeral or graduation at this central point you spoke of?

A. My impression is that there was one in front and another one in the back of the scale to designate the weight.

XQ. 57. I notice on these bills or invoices that you produced some items down as "Imp. Scales." Does that abbreviation signify "Improved," or do you remember about that?

A. No, it means "Imperial." Two Imperial scales, $37.50, would be $18.75 apiece. I think that that was a special scale, about which I have very little recollection.

XQ. 58. Were those Imperial scales Smith scales or Boston scales?

A. Yes, sir. They were a butter scale. I remember now.

XQ. 59. You mean that they were also of this hanging cylinder type.

A. Yes, sir; the cylinder was small in diameter, long, and had less figures on it; they went from about twenty or twenty-five cents up to either fifty or sixty cents.

XQ. 60. Do you remember enough about those Boston scales that either the William G. Bell Company or the Boston Computing Scale Company handled to state whether or not the thick, heavy paper in any of them was paper that had been treated in any manner for the purpose of stiffening it, or rendering it moisture proof?

A. I cannot state positively; I can state my impression.

XQ. 61. What is your best recollection about that?

A. Well, that it was.

XQ. 62. Do you recollect anything about the fastening of

the thick, heavy paper to the skeleton frame by the use of wires which passed around the paper and were coiled about portions of the skeleton frame?

A. I think if it had I should remember it.

XQ. 63. Do you recollect the employment of wires, wrapped around portions of the skeleton frame for any such purpose as securing a correct balance of the cylinder in its bearing?

A. No, I think not. I don't remember it.

XQ. 64. Did you have occasion to remove the exterior casings from those scales and inspect the parts that would ordinarily be concealed by the casing?

A. I presume I have seen them, but I cannot give you any of my recollections.

XQ. 65. Would any controversy that arose between the William G. Bell Company, or the Boston Computing Scale Company, and the sealer's office, be brought to your notice, or were those things all looked after by Mr. Luce, here in Boston?

A. Mr. Luce had the general management of everything of that sort, but I think if there had been any controversy I should naturally have heard of it.

XQ. 66. Do you recollect instances of condemnation of those scales and the return of the condemned scales for treatment to remove the difficulty that caused incorrect action?

A. I have no recollection at this late date that there was.

XQ. 67. Do you remember differences in the construction of scales supplied to you by the Smith people subsequent to the first scales you got from them, other than the differences in the material of the outside casing, to which you have already referred?

A. No, I do not, other than the Imperial, of which I have already spoken.

XQ. 68. Do you recollect any scales having been supplied to you by the Smith Company wherein a thin sheet of paper was used for the chart, as distinguished from the thick, heavy sheet to which you have referred?

A. I don't think I do; not that I can recollect.

XQ. 69. According to your recollection, then, all of the scales that you got from the Smith people had the thick, heavy sheet of paper for the chart; is that the case?

A. I don't think I do; not that I can recollect.

XQ. 70. Do you remember whether in those scales there

were dash-pots or air checks for dampening or modifying the vibrations of the pan and the oscillation of the cylinder when goods were placed in the pan?

A. I don't recolect whether that was done under our supervision or afterwards. I remember that it was done, but whether it was done in the scales we handled, or afterwards, I don't remember.

XQ. 71. Was it the custom with the William G. Bell Company, or the Boston Computing Scale Company, to get the scales on consignment from the E. C. Smith Company, or to procure them as you received orders for the scales?

A. They were not on consignment at all; they were purchased outright.

XQ. 72. You mean that you purchased the scales outright from the Smith Company?

A. Yes, sir.

XQ. 73. And did you so purchase the scales from time to time to keep in stock, or did you purchase them only as you procured orders?

A. My impression is that they shipped them as fast as they manufactured them.

XQ. 74. They simply shipped scales right along to you, without reference to the orders that you were giving?

A. I presume that the orders were given for a certain number of scales, and they would ship them as they could manufacture them, and then there would be another order placed.

XQ. 75. Do you remember about when it was that the Boston Computing Scale Company was organized and took over this business that had been handled by your own company direct?

A. The Boston Computing Scale Company was practically organized the moment the deal was made with the Smith people.

XQ. 76. Then you mean, do you, that there was no appreciable time during which the William G. Bell Company operated before the Boston Company was organized?

A. No, I think that the selling force of the Boston Computing Scale Company was started at the same time by Mr. Luce, and at the same time by the William G. Bell Company.

XQ. 77. Was there any assignment of rights under the patents to the William G. Bell Company?

A. No, I think not.

XQ. 78. What was the arrangement about handling the

scales prior to the date of this assignment from the Smith Company to the Boston Computing Scale Company, the date of that assignment being April 7th, 1898; I mean, the arrangement between the Boston Computing Scale Company, or the Bell Company, and the Smith Company?

A. The E. C. Smith Company April 7th, 1898, was represented by William G. Bell, with ninety-eight shares of stock, and by Alfred W. Bell, with two shares of stock, representing a capitalization of $5,000, this stock having been transferred to William G. and Alfred W. Bell by the original owners, which must have been in the early part of the year 1897.

XQ. 79. Then, am I to understand that the original acquisition of an interest in this Smith scale business by you and Mr. Luce came about by way of a transfer of stock of the Smith Company to you and Mr. Luce?

A. Yes, sir. I presume the transfer was made in that way, from the fact that I furnished the money to carry on the business; but the profits were always divided up equally between the Boston Computing Scale Company, which was Mr. Luce, and myself.

XQ. 80. Do you know how the Smith Company had fared in the scale business prior to the time when you and Mr. Luce bought it in?

A. I knew nothing about it except that it hadn't done, apparently, very much business.

XQ. 81. Who were the individuals with whom you negotiated when you bought your interest in the E. C. Smith Company?

A. The two Smiths.

XQ. 82. You mean Albert U. Smith and Edmond C. Smith?

A. Yes, sir; one was the inventor, and the other, as I understand it, furnished the money.

XQ. 83. Did you have occasion to inspect their plant at the time you became interested in their company?

A. I went through their shops.

XQ. 84. How much of a plant did they have?

By Mr. Richmond: Objected to. Irrelevant and immaterial, and not proper cross-examination.

A. A moderate one.

XQ. 85. That plant was located at Saugatuck, Connecticut?

A. Yes, sir.

XQ. 86. Do you remember about what the equipment of the plant amounted to at that time?

By Mr. Richmond: Same objection.

A. I do not.

XQ. 87. What was the first thing done, after you and Mr. Luce bought your interest in the Smith Company, by way of pushing the scale business?

A. We immediately organized the Boston Computing Scale Company, and Mr. Luce left the employ of the William G. Bell Company and devoted his entire time to the management and sale of these scales.

XQ. 88. What sort of advertising was done?

A. I don't remember that we did any advertising.

XQ. 89. Did the William G. Bell Company at that time have a selling organization, such as a body of men whose business it was to go about the country getting orders for your goods in various lines?

A. They did not.

XQ. 90. Was the Boston Computing Scale Company organized with a selling force?

A. Yes, sir.

XQ. 91. It operated, then, I gather, quite independently of the William G. Bell Company?

A. Yes, sir; the Boston Computing Scale Company did, and they were very jealous of the William G. Bell Company.

XQ. 92. The Boston Computing Scale Company was organized, was it, early in 1897?

A. That is my impression; at the very start.

XQ. 93. You spoke about the Dayton product having been on the market during the time that the Boston Computing Scale Company was handling the Smith scales. Do you remember how the prices of the Dayton Computing Scale compared with the prices asked for the Smith scale?

A. I think theirs was about double; that is my impression.

XQ. 94. That is, the scales sold by the Boston Computing Scale Company were only one-half the price?

A. My impression is, less than half.

XQ. 95. After the assignment of the patent rights by the Smith Company to the Boston Computing Scale Company, did the profits still continue to be divided between the two companies? I understand you to say at a previous point that there was a division of profits, share and share alike, between the Smith Company and the Boston Company.

A. No, not at all. The division of the profits of all sales made by the Boston Computing Scale Company were divided equally between Mr. William G. Bell and Mr. Charles R. Luce, the Smith Company never receiving one dollar of the profits in any way, shape or manner from the Boston Computing Scale Company or the William G. Bell Company.

XQ. 96. Did Mr. Luce offer to buy out your interest in the scale business when the differences arose between you and him, or these causes of annoyance made you disposed to retire from the scale business?

A. I don't think so.

XQ. 97. Do you know why it was that he chose to give up the scale business rather than to endeavor to keep on with it?

A. Because I wasn't willing to retain it.

XQ. 98. How profitable a business had it been, as compared, for example, with the business of the William G. Bell Company; I merely want you to state how profitable a business that whole scale business was as compared with your own business, the business of the William G. Bell Company; how did they compare?

A. I cannot answer that question without having a better understanding of what you mean.

XQ. 99. You alluded at one point to the Boston Computing Scale Company being somewhat jealous of the William G. Bell Company, and I am asking you how the two enterprises compared in the matter of profits or success; in other words, was this jealousy occasioned by the fact that the William G. Bell Company was doing better than the scale company?

A. This business was bought by myself at the suggestion of Mr. Luce, and I gave him a one-half interest, with the understanding that the William G. Bell Company should be allowed to continue the sale of the scales and receive them at the net cost that we were paying to the E. C. Smith Company, and that continued up to the—so long as we continued in business. It was part of the bargain, and I insisted upon it, and while our sales were confined to our own sales room, without any one ever going outside of the store, they were so much in a certain length of time that there was a profit to the William G. Bell Company of, I think, $5,000; the Boston Computing Scale Company had a surplus at one time of over $5,000.

XQ. 100. Then, as I now understand you, the William G.

Bell Company and the Boston Computing Scale Company, both handled those scales during the period of time when this business was being done here in Boston?

A. Yes, sir.

XQ. 101. Was this scale business confined to the handling of the Smith hanging cylinder scale, or were other types of scales handled by the Boston Computing Scale Company, or by the William G. Bell Company during that same period of time?

A. No other type of computing scale, and no other scale by the Boston Computing Scale Company.

XQ. 102. What was this Acme scale that is billed in the invoice of March 15, 1897, as sold to Boston Computing Scale Company by William G. Bell Company?

A. Those were the scales manufactured by the Smith Company, and when they became the property of the Bell Company, or the Boston Computing Scale Company, they were shipped as the Acme scale by the Smith people and known as the Boston computing scale, and sales were made either by the Boston Computing Scale Company or the William G. Bell Company.

XQ. 103. How about the Imperial scale? Was that put on the market under your name?

A. The Boston computing scale. We simply called it our Imperial brand, our Imperial butter.

XQ. 104. After you and Mr. Luce bought your interests in the E. C. Smith Company, and the Boston Computing Scale Company was organized, did the latter company and the William G. Bell Company handle the entire output of the factory of the E. C. Smith Company at Saugatuck, or did the E. C. Smith Company supply scales to other selling organizations or concerns in other parts of the country, or in Boston?

A. Owned exclusively by the Boston Computing Scale Company and no sales made other than through them.

XQ. 105. Then the business to which you have referred as done by the Boston Computing Scale Company and the William G. Bell Company, during the time between the acquisition of your interests in the Smith Company, and the time when the Boston Computing Scale Company sold out to the Dayton Company, was the entire business done in Smith scales, was it? That is to say, in scales manufactured by the Smith Company?

A. Yes; that is right, as I understand the question.

XQ. 106. On what sort of terms were those Smith scales sold either by the William G. Bell Company, or by the Boston Computing Scale Company?

A. My impression is, largely on the installment plan. To illustrate, I have here a bill, if you would like to see it.

XQ. 107. What does this bill that you have exhibited indicate as to the selling price of the Smith scale and the partial payment plan?

A. Well, he has stated on the bottom of the bill that the first payment, on delivery of scale, was $7.50; the second payment, due and payable on November 15th, was $7.50; and the third, and I presume the last payment, December 15th, $7.50, making a total of $22.50; that would be the scale that cost us $7.50 at the factory.

XQ. 108. Do you remember about what the selling price of the Dayton computing scale was, that is, the Dayton scale which was on the market during the time when you handled the Smith scale?

A. My impression is, about $60. It was a platform scale. My impression is that along at the last of it that this same scale, with the improved outside covering, was sold at $40.

XQ. 109. Do you remember enough about the construction of the Smith scale of that period to state what sort of bearings were employed for the cylinder to turn in?

A. No, I couldn't.

XQ. 110. Do you remember what the reason was for the assignment of patents to the Boston Computing Scale Company not having been made for more than a year after the organization of the company?

A. I think simply a personal oversight more than anything else; a matter that was not considered of much importance; that would be my impression. I had forgotten all about the facts of the transfer of the stock until a few days ago. I happened to run across it in my private box—the transfer of the 100 shares of stock.

XQ. 111. Did Mr. Luce continue in the scale business after the Boston Computing Scale Company sold out to the Dayton Company?

A. We both quit and agreed not to enter into the business for two years. I did, however, enter into the sale of the Dayton scale, and they were the people we sold to, and they were very glad to have us handle them for them; but Mr. Luce did not.

XQ. 112. What became of Mr. Luce?

A. He went to Heaven, I hope, a few years afterwards. We were very good friends after the sale had been consummated, and we were before.

Cross-examination closed.

Redirect Examination by Mr. Richmond.

RDQ. 113. How thick was the paper on the rotating drums on those Boston computing scales?

A. I haven't an idea exactly; I cannot tell you, but my impression is it would be thicker than that, perhaps twice as thick. It was substantial.

RDQ. 114. Please state on the record just what it was that you referred to for the purpose of comparison in the foregoing answer?

A. Well, I don't think I ought to state in regard to it; it was a good, heavy paper.

RDQ. 115. Well, would you call it paper or pasteboard?

A. I would call it good, heavy paper, as I remember it. I don't think it was pasteboard.

RDQ. 116. How would you say that it compared with this magazine cover to which you referred a moment ago, and which I now hand you?

A. Well, my impression would be, as thick again.

By Mr. Richmond: The piece of paper referred to in the foregoing answer is offered in evidence and the Examiner is requested to designate it "Complainant's Exhibit Sample Magazine Cover."

RDQ. 117. How confidently do you rely on this estimate, or within what range do you feel confident that the thickness lay?

A. From the fact that the paper on the cylinder was smooth and even. That is the best answer I can give you.

RDQ. 118. About when was it that Mr. Charles R. Luce died?

A. Well, I have an idea it might have been five or six years ago. It may be longer. He lived some few years after this sale was consummated. I don't remember just when.

RDQ. 119. What proportion of your business in those Boston computing scales was in the New England States?

A. I think the larger part of it; we made very little effort outside.

RDQ. 120. What proportion of those scales were condemned by official sealers of weights and measures?

A. I haven't any idea. My impression would be, very few.

RDQ. 121. When you sold out to the Computing Scale Company of Dayton, it not only terminated the business of the Boston Computing Scale Company, but also of the W. G. Bell Company in those Boston computing scales, did it not?

A. Except the stock that we had on hand; we reserved the right to sell what they had on hand.

RDQ. 122. Can you give us an idea of how many?

A. Forty or fifty scales, perhaps. The stock of the Boston Computing Scale Company was turned over to the Dayton people.

RDQ. 123. Did the Smith people, the manufacturers of those scales, make other types of scales?

A. Not that I know of.

RDQ. 124. You have referred to a Dayton scale that was on the market prior to, or at the time of your handling the Boston computing scale, and I think you have stated that it did not have a chart; is that scale on the market to-day?

A. I couldnt' tell you.

RDQ. 125. Do you know of its being on the market to-day?

A. No, I do not.

RDQ. 126. In explaining the delay in executing the assignment of the patents to the Boston Computing Scale Company, you suggested that you regarded it as a matter of no particular importance. Will you please state why?

A. Well, the E. C. Smith Company really did no business after the sale was made, after the purchase, as a corporation, and that was simply a matter of form, the transferring of that, in order to protect all concerned, more than anything else, I think, the transfer of that corporation stock.

RDQ. 127. Who controlled the E. C. Smith Company?

A. The stock stood in my name and also in that of my son. Whether that was ever transferred or not I couldn't tell you. I know I have those two certificates, one to myself and one to Alfred.

RDQ. 128. Did it lie within your power to have the assignment of those patents made to the Computing Scale Company after you entered on those business relations?

A. I cannot tell you when they were assigned to me. They may have been assigned at the very first. The records at Washington would show that, I presume. I haven't given this matter a thought for twelve years until just now.

RDQ. 129. Was this scale that we have been talking about ever known as the Boston butcher scale in this section?

By Mr. Davis: Objected to as leading.

A. It may have been called that.

Redirect examination closed.

Recross Examination by Mr. Davis.

RXQ. 130. Don't you think that the material of which the charts were composed in those Smith scales, as you recollect the same, would be more properly classed as cardboard than as paper.

By Mr. Richmond: Objected to as incompetent, this witness not having qualified as an expert in this nomenclature.

A. Not as I recollect it. Very thick paper could oftentimes be classed as cardboard, but as I recollect it, I should call it paper rather than cardboard.

RXQ. 131. Would you be prepared to state positively that the thickness of that material was not equal to three or four thicknesses of this magazine cover that has been put in evidence?

A. It would be my impression not.

RXQ. 132. But you couldn't say positively?

A. I would not say positively.

RXQ. 133. Do you retain at present any interest in the E. C. Smith Company?

A. No, sir; not to the value of a penny.

RXQ. 134. You have an interest in the Computing Scale Company of Dayton, the plaintiff in this case?

A. I wish I had; not for a penny.

RXQ. 135. Or in the Moneyweight Scale Company?

A. No scale company whatsoever.

Recross examination closed.

Deposition closed.

WILLIAM G. BELL.

Commonwealth of Massachusetts, } ss.
Suffolk, }

I, Albert Garceau, a Notary Public in and for said County and Commonwealth, duly commissioned and qualified, and authorized to administer oaths and to take and certify depositions, do hereby certify that, pursuant to the annexed motion

issued and served in the civil cause depending in the District Court of the United States for the Northern District of Illinois, wherein The Computing Scale Company is plaintiff and Toledo Computing Scale Company defendant, I was attended at the office of Thomas A. Mullen, No. 15 State Street, in Boston, by Carl A. Richmond, counsel for said plaintiff, and also by Frank P. Davis, counsel for defendant, on the day hereinbefore stated; that the aforenamed witness, William G. Bell, who was of sound mind and lawful age, and was by me first carefully examined and cautioned and duly sworn to testify the truth, the whole truth and nothing but the truth, and he thereupon testified as is above shown, and that the deposition by him subscribed, as above set forth, was taken in shorthand and reduced to typewriting by Helen M. McDermott, under my personal supervision, and was subscribed by the said witness in my presence, and was taken at the place in the annexed motion specified, and at the times as set forth, adjournments being had or taken from day to day as provided for in said notice. I further certify that the reasons for taking the said deposition was, and is, and the fact was, and is, that the deponent lives in Boston, more than 100 miles from the place where the said civil issue is appointed by law to be tried; that I am neither of counsel nor attorney to either of the parties to said suit, nor interested in the event of said cause, and that it being impractical for me to deliver said deposition and the exhibits thereto attached with my own hands into the court for which they were taken, I have retained the same for the purpose of being sealed up and directed with my own hand, and speedily and safely transmitted to the said court for which it was taken, and to remain under my seal until there opened.

As witness my hand and seal as such Special Examiner at Boston on this tenth day of April, 1912.

ALBERT GARCEAU,
Notary Public.

(Seal.)

DISTRICT COURT OF THE UNITED STATES,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company, } In Equity.
vs. } No. 30,024.
Toledo Computing Scale Company. }

Testimony in rebuttal taken on behalf of complainant, pursuant to the statutes and equity rules, before Annie C. Courtenay, a Notary Public, acting as Special Examiner by consent, at the offices of Messrs. Sheridan, Wilkinson, Scott & Richmond, No. 140 S. Dearborn Street, Chicago, Illinois, Thursday, April 11, 1912, at 11 o'clock A. M., pursuant to agreement of counsel.

Present:

Messrs. W. A. Scott and C. A. Richmond, for complainant;

Frank P. Davis, Esq., for defendant.

THOMAS P. SULLIVAN, a witness produced, sworn and examined on the part of complainant, deposes and testifies as follows in answer to questions by Mr. Scott:

Q. 1. Please state your name, age, residence and occupation.

A. Thomas P. Sullivan; 55 years; 4823 Kenmore Avenue, Chicago, Illinois; I am a retail grocer.

Q. 2. How long have you been in the grocery business?

A. Forty years.

Q. 3. Have you been connected with any trade organizations during that period?

A. Yes, sir. For the last ten years, very actively. I am now approximating the time of ten years. I was one of the organizers of the North Side Retail Grocers & Butchers' Association about the year 1902, and was president of it for two years after it was organized, and during my incumbency of the office of president of the North Side Association there was established here in Chicago a central committee of retail grocers and market men. I was president of that for two

years; and about this time I was elected at a convention here in Illinois—I cannot just name the town—as a director of the Illinois Retail Merchants' Association. During this period of time I was elected in Boston as vice-president of the Retail Grocers' National Association; and the following year in Portland, Oregon, I was elected president of the National Association of Retail Grocers, a position which I held for two years, ending in Denver, June, 1911. I have not held any official position since that time, although I am consulted by the national officers on matters that come up very often, and very often my views are asked on questions pertaining to trade conditions by the local organizations.

Q. 4. Have you had any experience with computing scales, or have you observed the use of computing scales during the period you have been in business.

A. Yes, sir; I have both. I have had experience and I have observed. The observation I might explain in this way: The associations I have been connected with for the last number of years have compelled me to travel a great deal; and in periods of this time when I happen to be in a town I usually drop into a store or two in that town during my spare time, just to see out of mere curiosity if business in that town is handled in the same way as it is handled in my town. The experience with the computing scale in my case dates back to possibly 1902, when I used it in my meat department. By this I mean the automatic type. We at that time used for a few years in the meat department what I would describe as a disk scale, which we afterwards exchanged for what we knew at that time as a Boston or barrel scale, and we have since used that type of scale in our meat department. We had used in the grocery department in 1896 or '97 a scale called the Moneyweight scale with a beam, or possibly two beams, wherein you would have to shift those beams to find the moneyweight value of the commodity on the platform. This type of scale we did not like, and we returned the scale after a very short trial, replacing the same with the ordinary even balanced scale.

Q. 5. Will you describe in a general way the appearance and mode of operation of the barrel or Boston scale to which you have referred? By mode of operation, I mean the manner in which the scale was used by the grocer or butcher.

A. Well, the scale was, I believe, supported, if I remember right, at that time with a device with a counter stand which held the barrel from a central support. The commodity placed

on the platform of this scale would in some way cause the barrel to revolve, and through an opening or aperture in the dealer's side of the scale you could determine the value of your commodity by a chart which was so adapted to that scale.

Q. 6. What form did this chart take, that is, what was it mounted on and what shape was it?

A. It was mounted on a light frame of some kind.

Q. 7. Was it a flat chart?

A. No, sir; it was circular—drum-shaped.

Q. 8. In what position was this drum mounted; that is, vertically or horizontally?

A. Horizontally.

Q. 9. In what manner were the values marked upon this drum. Upon the ends of the drum or upon the curved side?

A. Upon the curved side.

Q. 10. Were there values for different prices per pound upon the chart?

A. Yes, sir.

Q. 11. What means, if any, were there for enabling the user of the scale to pick out the proper value for the price per pound of the article being weighed?

A. The scale across the face of it on the dealer's side had a narrow opening lateral, which showed the money value of the commodity on the scale at so much per pound, and also an opening which enabled the dealer to know the pound and ounce value of the commodity on the scale.

Q. 12. This opening, as I understand it, was in the casing of the scale.

A. In the casing that surrounded the revolving drum.

Q. 13. Please state whether any means were provided for reading the weight of the commodity from the customer's side of the scale.

A. Yes, there was an opening on the customer's side, which showed the pound and ounce value of the commodity on the scale. Computations were not shown on the customer's side of the scale. I might qualify that in this way, that often when weighing a fowl or piece of meat at so much per pound, and the article would weigh a pound and a fraction thereof, the customer would wonder how we could determine the value so quickly, and many times I have turned the scale round and showed the customer the means by which we determined the value so quickly, which was the mechanical computation on the dealer's side.

Q. 14. Among the scales before you in this room, do you find any of the kind to which you have just referred?

A. Yes, sir. (The witness indicates "Complainant's Exhibit Cylinder Scale.")

Q. 15. Will you state whether you have seen or used any barrel or drum scales other than of the type of "Complainant's Exhibit Cylinder Scale"?

A. "Yes, sir.

Q. 16. In what way did these cylinder or drum scales differ from the type of scales to which "Complainant's Exhibit Cylinder Scale" belongs?

A. The scale that we used mostly and liked better is the one we are using now, in which the stand is part of the scale. It occupies less room on the counter and is neater in design.

Q. 17. Do you recognize any of these latter scales among those before you?

A. The scale marked "Complainant's Exhibit Complainant's Scale" is the nearest in design and appearance to the one we are using of any I see here.

Q. 18. Will you state when you first saw any of these drum or barrel scales such as you have described?

A. It is a difficult matter to set the exact time in my mind when I first saw drum scales—I mean by that a drum computing scale; as I am a man that observed devices very closely that I could apply in some way to my business, I believe I can go back at least ten or twelve years to fix approximately the date when I first noticed a drum scale of the character you describe.

Q. 19. Will you state when and where you remember seeing some of the early cylinder scales—that is, scales in which the placing of the commodity upon the pan or platform acted automatically to revolve a cylindrical chart bearing weight and price indications?

A. Answering the question of where, principally in my home town Chicago; but to fix an accurate date at a far-away point, I had occasion to go into the Pacific Northwest during the summer of 1903, and while making Spokane, Wash., there our headquarters, I had occasion to go down to Lewiston, Idaho, which seems to my mind to be a much lower level than Spokane, as I thought it was the last place in the world a white man would seek to live in in midsummer, as the town appeared to me to be in the bottom of the canon surrounded on all sides by hills or mountains of arid land; and while in that town I incidentally dropped into a store there and observed in that store a Moneyweight computing scale of the

drum type on the counter, and it came to my mind at the time that aggressiveness of the corporation that discovered that little place and sold those scales there.

Q. 20. How do you fix the date of this occurrence as being in 1903?

A. Well, this was the beginning of my many pilgrimages. In this year I was asked to join a party going into the Pacific Northwest, with the purpose in view of looking over some land to be irrigated and placed on the market. I mention this because the following year—1904—I attended the Grocers National Convention in San Francisco.

Q. 21. Will you state the lines of business in which you have found the automatic drum or cylinder scales in use, and, in a general way, to what extent?

A. I would answer the first question in all lines of food business—such as delicatessens, grocery stores and markets, and cheese and butter stores, which are sometimes operated separately. The extent of use to my mind of the scales would differ. I believe that the meat markets will run as high as 85% or 90% of dealers using a drum scale; delicatessens, I think, would run possibly as high as the meat markets—85% or 90%; grocery stores not over 50%.

Q. 22. From your experience can you give any reason why these automatic cylinder scales are used so extensively?

A. The nature of the meat and delicatessen business really demands a computing scale of some kind, and up to this time the drum scale seems to be the best one in use. The present high values of commodities in the food line compel the merchant in justice to himself and also to his customer to equip his store with the best mechanical device obtainable to arrive at the values correctly; furthermore, meats both cooked and uncooked, cannot be measured out on a pound and ounce basis to any advantage. In other words, the cut of meat, or a cut of cheese, invariably weighs more or less than the amount called for on a pound and ounce basis.

Cross-Examination by Mr. Davis.

XQ. 23. During the last ten years when you have been traveling about and observing appliances employed in grocery stores and other places where food products are handled, you have seen in use, I suppose, other kinds of computing scales than those of the cylinder type, have you not?

A. Yes, sir.

XQ. 24. Have you not seen a good many such scales of the Toledo make, having what is commonly called the fan-shaped computing chart?

A. Yes, sir.

XQ. 25. At the time you first became familiar with a computing scale of the hanging cylinder or barrel type such as "Complainant's Exhibit Cylinder Scale," did you obtain any familiarity with the internal construction of the same, by which I mean the construction that is concealed from view in the complete organized scale by the inclosing casing?

A. Yes, sir.

XQ. 26. Do you recall particulars of that internal construction, as, for instance, the material of which the chart was composed, or the precise manner in which the chart was secured upon the frame?

A. Only to this degree, that the framework seemed to be a very delicate metal composition, and the chart a thin substance of something the nature of paper. I might qualify this answer and explain why I would open and looked into the concealed parts of the scale. My earlier training had been in the mechanical line, and in after years I patented a device to be used on an oil tank, wherein the merchant could determine the amount of oil poured in there from one of the oil wagons which came round with a quantity to sell to the grocer. Always having a liking for mechanical constructions and a liking for tools, I have in possession in my flat building, wherein the store is located, quite a complete set of tools, and I usually upon buying some device similar to a cash register immediately take it apart as far as I think it safe to do so in order to see the principle involved in the construction thereof and if I could not in some way improve upon it; just simply to gratify my curiosity and my mechanical inclination.

XQ. 27. Is your recollection sufficiently clear as to internal construction of the cylinder scales with which you first became familiar, to enable you to state whether the "thin substance of something in the nature of paper" of which you have stated the chart of those scales was composed, bore evidence of having been subjected to treatment to render it stiff and keep it smooth, and make it moisture proof?

A. I would answer yes to that, and qualify it in this way: that the chart would become discolored or dirty from usage, and I have had occasion to remove the front part of the scale and wipe off the foreign matter thereon by some cloth of a soft kind, and in that way I realized that the chart had been

treated in some manner to give it a glaze, or a smooth surface.

XQ. 28. Do you recall whether the chart of those scales was fastened to the frame by wire wrapped around the chart?

A. No.

XQ. 29. Do you mean that you do not recollect?

A. I mean that I can't recall the mode of fastening the chart to the frame.

XQ. 30. Do you recall whether in those scales there were small pieces of metal upon the spokes of the frame for the purpose of obtaining a correct balance of the rotary cylinder in its bearings?

A. No, I don't recall anything of that nature. They may, however, have been there, but I would not know the purpose of them.

XQ. 31. Do you remember in what sort of bearings the cylinder turned in those scales; that is, whether ordinary journal bearings or roller bearings?

A. My impression is that there was apparently a bearing there of a pivot nature with a cog wheel on the end, on which a metal arm with a cog would go in mesh with the cog on the journal or pivot bearing in order to operate the same.

XQ. 32. Do you remember whether those first scales which you became familiar with had index pointers such as in "Complainant's Exhibit Cylinder Scale," which consist in metal projections from the inclosing casing at the side of the opening which expose the weight graduations in numerals?

A. This I cannot state definitely, but my impression is there was a finger or some point that extended out in order to know what point to compute from on the pound and ounce opening.

XQ. 33. You have stated that you are now using in your establishment a cylinder scale similar to "Complainant's Exhibit Complainant's Scale." How long ago was it that such a scale was acquired by you to take the place of any cylinder scale of the hanging type, like "Complainant's Exhibit Cylinder Scale"?

A. The period of time is rather hazy in my mind as to when I first changed from "Complainant's Exhibit Cylinder Scale" to "Complainant's Exhibit Complainant's Scale." The scale I have in my business place now is a later model of "Complainant's Exhibit Complainant's Scale"; and I think between the scale I have now and the period of doing away with the hanging scale we had another scale of the platform

type, which I am not so sure about, but my impression is along this line. I have had my present scale possibly three years.

XQ. 34. Do you remember how long prior to that you had the earlier platform scale?

A. No, I can't say as to that.

XQ. 35. When you were first solicited to purchase a scale of the platform type to displace a scale of the hanging type what representations were made to you concerning the advantages of the platform scale over the hanging scale?

Objected to as irrlevant and immaterial in that the question calls for nothing relating to the direct examination, nor anything tending to prove an issue of this case.

A. My memory is the fact of style, appearance, occupying less room on the counter, and containing many points of refinement.

XQ. 36. Do you remember whether any point was made of greater accuracy or increased sensitiveness, due to what you mention as "refinements"?

A. I recall, I think, the fact that they mentioned that the journal bearings were more sensitive and the scale more accurate in its work.

Deposition closed.

THOMAS P. SULLIVAN.

Complainant's rebuttal testimony closed.

I, Annie C. Courtenay, a Notary Public in and for the County of Cook, in the State of Illinois, and Special Examiner by agreement, hereby certify that all the proceedings aforesaid were had as stated in the cause and named in the caption hereto; that on the 11th day of April, 1912, I was attended by Messrs. Walter A. Scott and Carl A. Richmond, counsel for complainant, and Mr. Frank P. Davis, counsel for defendant and by the witness Thomas P. Sullivan; that before giving his deposition the said witness was by me duly sworn to testify the truth, the whole truth, and nothing but the truth in said cause, and that his deposition was taken down by me in typewriting from his statements and afterwards read over and subscribed by him as and for his deposition in said cause: and that I am not related to or of counsel for either of said parties, or in any way interested in the result of said suit.

In testimony whereof I have hereunto set my hand and affixed my notarial seal this 12th day of April, A. D. 1912.

ANNIE C. COURTENAY,

(Seal) *Notary Public for Cook County.*

COMPLAINANT'S EXHIBITS.

UNITED STATES DISTRICT COURT

Northern District of Illinois

Eastern Division.

The Computing Scale Company

v.

Toledo Computing Scale Company

In Equity Number 30024.

COMPLAINANTS' EXHIBIT CERTIFIED COPY FILE WRAPPER & CONTENTS DE VILBISS PATENT 839736

ALBERT GARCEAU

(Seal) *Notary Public & Special Examiner*

Commission expires Dec. 20th 1912

2—390.

UNITED STATES OF AMERICA,

DEPARTMENT OF THE INTERIOR,

United States Patent Office.

To all to whom these presents shall come, Greeting:

This Is To Certify that the annexed is a true copy from the Records of this Office of the File Wrapper and Contents, in the matter of the Letters Patent of Allen De Vilbiss, Jr., Assignor, by mesne assignments, to Toledo Computing Scale Company, Number 839,736, Granted December 25, 1906, for Improvement in Computing-Scales.

In Testimony Whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the City of Washington, this 13th day of June, in the year of our Lord one thousand nine hundred and eleven and of the Independence of the United States of America the one hundred and thirty-fifth.

F A TENNANT

(Seal) *Assistant Commissioner of Patents.*

2—437.

Renewal
Collins *(Forfeited)* Div. 36
Number (Series of 1900).
210,406 *(55007)* 1901 Div. 36
(Ex'r's Book). *(313-134)*
Patent No. 839,736 668-46 *(1901)*
1904

Name Allen De Vilbiss, Jr.,
by mesne Assigts to
Assignor ^ *(to The De Vilbiss Computing Scale Company, of same place Their)*
Toledo Computing Scale Company, A Corp. of N. J.
of Toledo
County of
State of Ohio
Invention
Computing Scales

Parts of Application filed.	Original.	Renewed.
Petition	Apl 9, 1901	May 31, 1904
Affidavit	" ", 1901	, 190
Specification	" ", 1901	, 190
Drawing	" ", 1901	, 190
Model not required	, 190	, 190
Specimen	, 190	, 190
First Fee Cash $15,	Apl 9, 1901	$15, May 31, 1904
	V	V
" " Cert.	, 190	, 190
Appl. filed complete	Apl 9, 1901	May 31, 1904

1
(Printed in left-hand margin) Division of App., No. , filed , 190

2
Examined Geo. L. Morton Exam June 2, 1902
Geo. L. Morton Exam Dec 6, 1906
3
Countersigned J W Babson , 190 H B Burch , 19
For Commissioner. For Commissioner.

*Matter in italics in parentheses, stricken out in original transcript.

Notice of Allowance	June 3, 1902	Dec 8, 1906
Final Fee Cash	, 190	$20 Dec 6, 1906
" " Cert.	, 190	, 1906

2

Patented December 25 , 1906

3

Attorney Rector, Hibben, and Davis Attorney
1625 Monadnock Bl'd'g.
Address Chicago, Ill. Address
Patent No Date of Patent

*(*1 16 8*
2 17 9)
Cls
5
6

Amount Received
$15.00
Chief Clerk.

Docket Number
7220

In the U. S. Patent Office.

Application for Letters Patent.

Petition and Power of Attorney.

The Commissioner of Patents:

Your Petitioner, Allen De Vilbiss, Jr., a citizen of the United States and resident of and having his P. O. address at 737 West Washington St. Toledo in the County of Lucas and State of Ohio, prays that Letters Patent may be granted to him, in accordance with the provisions of Law, for the Improvements in Computing Scales set forth in the annexed Specification.

And he hereby appoints Collamer & Co. (Register No. 282; consisting of N. L. Collamer, Register No. 200) of Washington, D. C. as his Attorneys, with full power of substitution and revocation, to sign the drawings, to prosecute this application, to make alterations and amendments therein, to pay all fees relating thereto, to receive the Letters Patent whenever issued, and to conduct all business connected therewith.

ALLEN DE VILBISS JR.

U. S.
4/9/01
Revenue Stamp,
25 Cents.

*Matter in italics in parentheses, stricken out in original transcript.

Specification.

To All Whom It May Concern:

Be it known that I, Allen De Vilbiss Jr., a citizen of the United States and a resident of Toledo, Lucas County, State of Ohio, have invented certain new and useful Improvements in Computing Scales (Case No. 33); and my preferred manner of carrying out the invention is set forth in the following full, clear, and exact description terminating with claims particularly specifying the novelty.

This invention relates to scales of that class which compute or indicate the total weight and total price, preferably by means of a cylinder rotating on its axis within a casing which is provided with openings at suitable points to permit the dealer and the customer to see through them the results which it is desired shall be indicated; and the object of the present invention is to construct a scale of this type whose indicating mechanism—comprising the cylinder and the slotted casing—is combined with weighing mechanism substantially of the character covered by patents hitherto issued to me on this line of invention.

To this end the present invention consists in a construction of parts which shall adapt the indicating mechanism above described and the weighing mechanism to joint use in the simplest manner and whereby all necessary adjustments are permitted. The following specification describes my preferred manner of carrying out the invention whereas the claims embrace the salient points or combinations of elements—all as illustrated in the accompanying drawings, wherein:

Figure I is a side elevation of the weighing mechanism and a sectional view of the indicating mechanism.

Figure II is a plan view of this scale with the platform removed and the casing shown in section on a line through the main pivot.

Figure III is a longitudinal sectional view of the body portion of the casing with its drum-shaped housing partly broken away so as to show the cylinder in elevation therein.

1 is the main scale beam fulcrumed at 2 on a support which rises from the base, and 3 is a pan or platform having a standard 4 pivotally supported as at 5 upon said beam. The base supports a casing consisting of an upright body portion 127 (preferably having a rearward extension 129 and provided with a drum-shaped housing 130 at its top which has openings 131 and 132 for a purpose to appear below. 6 is a disk having knife-edge bearings 7 supported upon block 70

within the body portion of the casing, and from this disk hangs rigidly a pendulum 8 having a weight 9 at its lower end. The scale beam 1 is diverted from a straight line—as best seen at 100 in Figure II—so that within the body portion of the casing it passes completely around the disk and the parts attached thereto and returns again to the line of its body, and at its extreme end a link 11 leads upwardly from this beam and is connected as by knife edges with a link-pivot 10—here shown as an arm projecting radially from the disk 6. From the latter diametrically opposite the link-pivot projects a counter-balance arm 17 carrying a weight 18—the latter being sufficiently remote from the center 7 and of sufficient weight to counterbalance the weight of the link pivot, the link, that end of the main beam, the pan or platform, and the connections hereinafter described by means of which the indicating mechanism is moved. As indicated in section in Figure II, the arm 17 may be a screw and the weight 18 adjustable thereon, and I will hereinafter speak of this arm as a screw.

In connection with a scale of the above type, I preferably use indicating mechanism such as will now be described. Pivoted at 90 to the main beam is a fork 91 which extends upwardly, and thence outwardly, and then again upwardly into two arms 92 which are toothed so that they constitute rack bars. These engage the teeth of gears 93 mounted fast on the shaft 94 of the cylinder 95 rotatable within the housing 130, but it will be clear that any other suitabel form of connections might be employed for converting an upward movement of the main beam 1 into a rotary movement of the cylinder. Herein where I speak of the devices shown as "connections" for this purpose, I desire to be understood as including any equivalent devices for accomplishing this end.

The face of the cylinder is inscribed with a table 13, and in the present instance there are two bands around this cylinder which are inscribed with weight totals. Here one numbered 14 is at one end while the other numbered 140 is at the center of the length of the cylinder, and the latter has its figures inverted and is exhibited through the opening 131 to the customer at the rear end of the scale. The end-most row of weight totals here moves *(*over*) †under a pointer 133

Per A

*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

adjacent the opening 132 which is in the front side of the housing 130, or toward the dealer. *(*Obviously,* per A *the opening* 132 *might be continued across the row of weight totals* 114 *if preferred.*) On the front side of the housing adjacent the dealer is a row of Figures 192 giving the various prices per pound, and the table 13 on the cylinder carries the total prices which are so arranged thereon as to come under their respective prices per pound and be observable through the opening 132 when the proper weight total 14 comes opposite the pointer 133. I do not limit myself to this exact arrangement, but I prefer it in scales of this type.

The operation is as follows: The commodity being placed upon the pan or platform 3, the outer end of the scale beam 1 descends and through the link 11 causes a rotation of the disk 6 on its pivots 7, drawing the link pivot †arm ∧ 10 downwardly from its normal per A position which is above that of the main pivot 7. This swings the weight 9 to the right as indicated by the arrow and lifts the counterbalance weight 18 and the fork 91. I repeat that said weight 18 is of sufficient size and so adjusted on the screw 17 as to exactly counterbalance all parts of the scale when the later is at rest. Te pendulum 9 rises in proportion to the weight of the commodity, and the rack bars 92 turn the gears 93, and rotate the cylinder 95 on its axis 94, as will be clear. The row 140 of weight totals passing under the opening 131 is exposed to the customer who may see that he obtains full weight, and meanwhile the row 14 of weight totals passes under the pointer 133 and gives the same information to the dealer. With the present construction, however, that longitudinal row on the table 13 which corresponds to the total weight comes opposite the opening 13? on the dealer's side of the housing, and under the proper figures in the row 192 indicating the price per pound he can quickly see the total price. It is obvious that

†modified to some extent without departing from the spirit of my invention

this arrangement of openings could be ∧ *(*reversed* per A *or might be duplicated, or in some instance the axis*

*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

of the cylinder might stand parallel with the scale beam so that both the customer and the dealer would see the result of the computation.) The parts are of the desired sizes, shapes, proportions, and materials, and the invention may be used with or without other details which form no feature of the present case.

What is claimed as new is:

Insert C'

†5f

*(*8e 16c 1.*) In a scale, the combination with indicating mechanism of rotary character, *(*weighing*

†the pan

per B *mechanism including*) ∧ the main beam, and connections between said beam and the indicating mechanism for turning the latter proportionately to the movements of the former; of a disk, a main pivot

per A †arm

therefor, a pendulum carried thereby, a link-pivot ∧

per B †and projecting beyond the periphery of

per A supported by ∧ the disk, a link connecting this

†arm

per A pivot ∧ with the beam, and a counterbalance weight

†beyond the periphery of

projecting *(*from*) ∧ the disk opposite the link-

per B †arm

pivot ∧ and of a size adapted to counterbalance all movable parts which are not supported on their own pivots.

†of

*(*9e 17c 2*). In a scale, the combination with indi-

per B cating mechanism of rotary character, *(*weighing mechanism including*) the main beam, and connections between said beam and the indicating mechanism for turning the latter by the former; of a main

per B pivot, a pendulum hanging rigidly therefrom, *(*an*)

†a rigid †oblique

per B ∧ arm passing through said pivot at an ∧ angle to the

†arm

per A. pendulum and having a link-pivot ∧ at one end and a

†arm

per A screw at the other, a link connecting the link-pivot ∧ and the main beam, and a counter-balance weight adjustable on said screw and of a size adapted to counter-balance all movable parts which are not supported on their own pivots.

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*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

Sub B' **(3. In a scale, the combination with indicating mechanism of rotary character, weighing mechanism including the main beam, and connections between said beam and the indicating mechanism for turning the latter by the former; of a main pivot, a pendulum* †arm
per A *hanging rigidly therefrom, a link-pivot ∧ projecting from the main pivot and standing normally above the* †arm
per A *latter, a link connecting the link-pivot ∧ with the* †a single adjustable weight carried by the main pivot for counterbalancing all movable
per A *main beam, and (means for counterbalancing the the weight of all movable) parts which are not supported on their own pivots.)*

Insert A'

In testimony whereof I have hereunto subscribed my signature this the Apr. 1 day of , A. D. 1901

ALLEN DE VILBISS JR.

Witnesses:
EMMA EIBER
MAE TUTTLE

Oath or Affirmation.

State of Ohio } ss.
County of Lucas }

ALLEN DE VILBISS, JR., the above-named Petitioner, being duly sworn, deposes and says that he is a citizen of the United States and resident of Toledo, in the County of Lucas and State of Ohio; that he verily believes himself to be the original, first, and sole inventor of the Improvement in Computing Scales described and claimed in the annexed Specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof, or patented or described in any printed publication in any country before his invention or discovery thereof or more than two years prior to this application; or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent on said Improvement has been filed by him or his representatives or assigns in any foreign country.

ALLEN DE VILBISS JR.

*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

Sworn to and subscribed before me, this 21st day of April, A. D. 1901

MARTIN V BOYER
Notary Public

(Notarial Seal)
My commission expires Mar 14, 1903

(Endorsed) Serial No. 55007 Paper No. 1/2 Application. Filed Apr. 9 1901 De Vilbiss, A. Jr. Claims 1 2 *(3) Mail Room Apr 9 1901 U. S. Patent Office. U. S. Patent Office Apr 11 1901 Division 36.

2——260

Div. ..... Room No. 256.
Address only
"The Commissioner of Patents,
Washington, D. C."

Paper No. .....
All communications respecting this application should give the serial number, date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
United States Patent Office
Washington, D. C., May 4, 1901.
Mailed " " "

Allen De Vilbiss, Jr.,
C/o Collamer & Co.,
City.

Please find below a communication from the Examiner in charge of your application.
Ser No. 55,007, filed April 9, 1901, for "Computing Scales."

F. I. ALLEN,
Commissioner of Patents.

This application has been examined.

The reference numbers, 13, 14 and 114, used in the specification do not appear upon the drawing. In line 24 of page 4 of the specification, "over" should be past. Lines 26-28 of the same page are ambiguous. The modifications referred to in lines 1-5 of page 6 should be illustrated, or reference thereto erased. The claims are incorrect in specifying that a link pivot is connected to the disk. The member 10, as shown, is an arm, and not a pivot.

Claim 3 is rejected upon the patent to McCormick, No.

108,807, Nov. 1, 1870, in view of the patent to Sampson, No. 6,852, Nov. 6, 1849, both in Pendulum Scales. Sampson shows means for counterbalancing the platform mechanism independently of the pendulum, and it would involve no invention to apply this expedient to McCormick's scale.

GEO. L. MORTON
Examiner Div. 36.

F. F. R.

(Endorsed) Serial No. 55,007 Paper No. 1 Rejection Dated May 4, 1901. De Vilbiss, Jr., Allen

IN THE UNITED STATES PATENT OFFICE.

		*(*19 to 22*)
Docket Number		Pending in Room
7220	HRC-C	256
In re Application of—	Filed on or about—	8
Allen DeVilbiss, Jr.,	April 9, 1901	9
For Improvements in—	Serial Number—	10
Computing Scales,	55,007	11
A	Washington, D. C.—	
	May 10, 1901.	

The Commissioner of Patents:

Sir—The above-entitled application is hereby respectfully submitted for re-examination under Section 4903 of the Revised Statutes, in connection with the following—

Amendment.

√Page 4 of the specification, line 24, change "over" to "under"

√Cancel the sentence beginning line 26 "Obviously," and ending line 28 "if preferred."

√Page 5, line 11, after "pivot" insert "arm."

√Page 6, cancel from "reversed" line 1, to "computation." line 5, and substitute "modified to some extent without departing from the spirit of my invention."

√Claim 1, lines 7, 8 and 9, after "link-pivot" insert "-arm."

√Claim 2, lines 8 and 9, after "link-pivot" insert "-arm."

√Claim 3, lines 6 and 8, after "link-pivot" insert "-arm."

*Matter in italics in parentheses, stricken out in original transcript.

Cancel line 9 and substitute "a single adjustable weight carried by the main pivot for counterbalancing all movable."

√Add the following claims:

*(*11e 19c* "4.) 8f In a scale, the combination with indicating mechanism of a rotary character mounted on an axis, a gear thereon, the weighing mechanism including a main beam diverted from †standing
A' pr B the line of its straight body, a pivot ∧ within the divergent portion of the beam, a pendulum hanging †at one side of said pivot between the pendulum
per B from and connections ∧ *(*between the latter*) and the †at the other side of said pivot
per B beam of a rack bar pivoted to the beam ∧ with its teeth engaging the gear of the indicating mechanism, and means for counterbalancing all movable parts which are not supported on their own pivots.

*(*12e 20c*) "5 9f In a scale, the combination with indicating mechanism of a rotary character mounted on an axis, a gear thereon, the weighing mechanism including a main beam diverted from the line of its straight body, a pivoted disk standing within the divergent portion of the beam, a pendulum hanging †an arm projecting from the disk
per B from the disk, ∧ and connections between the latter †pivoted to the beam independent of said connections and having
per B and the beam; of a rack bar ∧ *(*connected to the beam with*) its teeth engaging the gear of the indicating mechanism, and means for counter-balancing all movable parts which are not supported on their own pivots.

†15e 10f
*(*21c "6.*) In a scale, the combination with the casing having a plurality of openings, a cylinder journaled on a horizontal axis therein and inscribed on its face with figures to move under said openings, certain of the figures being inverted with respect to the remainder in order to permit their reading from the opposite side of the casing, the weighing mechanism including a main beam, and a fork whose stem is pivoted to the latter and whose arms are connected with the hubs of the cylinder so as to rotate it as

*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

the beams moves; of a pendulum mounted on a main pivot, a link-pivot-arm projecting from the latter, a link connecting the link-pivot-arm with the main beam, and means for counterbalancing the weight of all movable parts which are not supported on their own pivots.

†14e 11f

*(*22c "7.*) In a scale, the combination with the casing having openings, a cylinder journaled on a horizontal axis therein and inscribed on its face with figures to move under said openings, the weighing mechanism including a main beam diverted from the line of its straight body, and a fork whose stem is pivoted to the main beam and whose arms are connected with the hubs of the cylinder so as to rotate it as the beam moves; of a pendulum mounted on a main pivot, a link-pivot-arm projecting from the latter, a link connecting the link-pivot-arm with the main beam, a counterbalance-arm projecting from the main pivot opposite the link-pivot-arm, and a counter-balance weight thereon of a size to offset the weight of the link-pivot-arm, the link, the main beam, the platform, the fork, and its connections, all substantially as described."

Insert D⁴

Remarks.

The numeral 14 has been added to Figure III of the drawings, which view already contains the numeral 13. The specification is not seen to describe the numeral 114. The part 10 is now called a "link-pivot-arm".

Claim 3 is amended to cover instead of the means for counterbalancing the parts, a single adjustable weight carried by the main pivot. The weight on the main pivot in the Sampson patent is merely a counterbalance for the index: it is the large weight *o* beneath the platform of the scale which counterbalances everything else. There is no adjustable counterbalance weight in the patent to McCormick though he makes his pendulum D of segment shape. It is thought this claim in its present condition will be allowed.

Four new claims are added herewith, covering details of construction which should be novel in view of the broader

*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

claims already granted. Claims 4, 5 and 7 have for their particularly novel element the diverted portion 100 of the main beam 1, within which bend of this beam the other mechanism is more or less broadly claimed in these clauses; and new claim 6 above has for its novel feature a plurality of openings in the casing combined with the arrangement of figures in bands of which one has its numerals inverted so that the result can be read by the customer and the dealer at the same time. It is thought that these specific claims should be allowed along with the others.

Very respectfully,

COLLAMER & Co.

(Endorsed) Serial No. 55,007 Paper No. 2 Amendment A Filed May 10 1901 De Vilbiss Jr., Allen Claims 4 5 6 7 U. S. Patent Office, May 10 1901 Division 36.

2—260

Div. ..... Room No. 256. Address only "The Commissioner of Patents, Washington, D. C."

Paper No. ..... All communications respecting this application should give the serial number, date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
United States Patent Office
Washington, D. C., May 24, 1901.
Mailed " " "

Allen De Vilbiss, Jr.,
C/o Collamer & Co.,
City.

Please find below a communication from the Examiner in charge of your application.

Ser No 55,007, filed April 9, 1901, for "Computing Scales."

F. I. ALLEN,
Commissioner of Patents.

This application has been examined in view of the amendment filed May 10, 1901.

Claims 4 and 5 are coextensive, and it seems necessary to retain but one of them in the case.

Claims 1, 2 and 3 are rejected upon the patent to Collier,

No. 281,753, July 24, 1883, in view of the patent to McCormick of record. Collier shows all of the combination specified by the claims, except "indicating mechanism of a rotary character." McCormick shows this, and it would involve no invention to apply this expedient to Collier's scale. The counterbalance and weight in Collier's scale is on the same side of the fulcrum as the link pivot, because the levers are so arranged as to produce a thrust on the connecting rod, instead of a pull. The alteration to the reverse arrangement would, however, involve no invention.

Claims 4 and 5 are rejected upon the patent to Kleinsteuber & Huebner, No. 246,318, Aug. 30, 1881, Pendulum Scales, in view of the patent to Collier cited above. It would involve no invention to apply to Kleinsteuber & Huebner's device a counterbalancing means, such as Collier has employed.

GEO. L. MORTON
Examiner Div. 36.

F. F. R.

(Endorsed) Serial No. 55,007 Payer No. 3 Rejection Dated May 24, 1901. De Vilbiss, Jr., A.

Cl 18

IN THE UNITED STATES PATENT OFFICE.

U. S. Patent Office,
May 23 1902
Division 36.
None
Docket Number
7220
In re Application of—
Allen De Vilbiss, Jr.
For Improvements in—
Computing Scale

Serial No. 55,007
Paper No. 4
Amendment B
Filed May 23 1902
Pending in Room
256
Filed on or about— Cl
Apr. 9, 1901 7
Serial Number *(10)
55007
Washington, D. C.—
May 23, 1902.

The Commissioner of Patents:

Sir—The above-entitled application is hereby respectfully submitted for re-examination under Section 4903 of the Revised Statutes, in connection with the following—

*Matter in italics in parentheses, stricken out in original transcript.

Amendment.

√Claim 1 line 2 erase "weighing mechanism including" and insert "the pan,"

√Line 7 after "by" insert "and projecting beyond the periphery of"

√Line 9 change "from" to "beyond the periphery of"

√Claim 2 line 2 erase "weighing mechanism including"

√Line 6 change "an" to "a rigid"

√Next line after "an" insert "oblique"

√Erase claim 3 and substitute:

7-10e-18c f B′ 3. In a scale, the combination with indicating mechanism of rotary character, weighing mechanism including the main beam, and connections between said beam and the indicating mechanism for turning the latter by the descent of one end of the former; of a main pivot, a pendulum hanging rigidly therefrom, a link-pivot arm projecting from the main pivot and standing normally above the latter, a link connecting the link-pivot arm with the descending end of the main beam, and a single adjustable weight carried by the main pivot opposite said link-pivot arm for counterbalancing all movable parts which are not supported on their own pivots."

√Claim 4 line 4 after "pivot" insert "standing"

√Line 6 erase "between the latter" and substitute "at one side of said pivot between the pendulum"

√Line 7 after "beam" insert "at the other side of said pivot"

√Claim 5 line 6 before "and" insert "an arm projecting from the disk,"

√Next line erase "connected to the beam with" and insert "pivoted to the beam independent of said connections and having"

Argument.

We are not quite prepared to concede that a thrust on the connecting rod is the equivalent of a pull applied at the other

side of the pivot, for in the claims are included means for counterbalancing all movable parts which are not supported on their own pivots (as are the cylinder and the disk, and the pendulum which hangs from the disk) and therefore this counterbalancing means off-sets the normal weight of the main beam and the pan which is not the case in either reference. The claims are amended to more particularly specify the structures covered thereby, and they are thought to avoid the reference for the following reasons:

The first covers the arm 10 rejecting from one side and the screw 17 projecting from the other side of the disk, and both claimed as extending beyond its periphery, while the second claim calls this a rigid arm the rod projecting completely through the disk at an oblique angle to the pendulum. Certainly no such rod is shown in the references, and the disposition of the counterpoise h in the reference Collier is not at an oblique angle to the pendulum D. The weight holder H in this patent is not rigid with the wheel A and hence it will not counterbalance accurately any part which moves with that wheel around its pivot and thus constantly changes in its effective weight. The reference McCormick has a segmental pendulum, part of which hangs vertical and the other part of which may be held to be a counterbalance for link e, but the operation of the link is far different from what takes place in applicant's scale.

The second claim also includes the adjustability of the weight which is not met in either reference—the adjustability of the beam h in Collier not having an equivalent effect.

Claim 3 is amended to include the connection of the devices with the descending end of the scale beam.

Claims 4 and 5 are amended to make them differ from each other and also to cause them to avoid the references.

Attention is again called to the fact that in all these claims the weight 18 counterbalances the main beam as well as the parts 10, 11, and 92. It was thought that claims 1 and 2 were allowed. It is assumed that claims 6 and 7 are now allowed.

Very respectfully,

COLLAMER & Co

Issue Division.
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

Serial No. 55,007

DEPARTMENT OF THE INTERIOR,
United States Patent Office,
Washington, D. C.,

June 3, 1902

Allen De Vilbiss Jr Assor
C/o Collamer & Co
City

Sir:

Your Application for a patent for an Improvement in Computing Scales filed April 9, 1901, has been examined and Allowed.

The final fee, Twenty Dollars, must be paid, and the Letters Patent bear date as of a day not later than Six Months from the time of this present notice of allowance.

If the final fee is not paid within that period the patent will be withheld, and your only relief will be by a renewal of the application, with additional fees, under the provisions of Section 4897, Revised Statutes. The office aims to deliver patents upon the day of their date, and on which their term begins to run; but to do this properly applicants will be expected to pay their final fees at least Twenty Days prior to the conclusion of the six months allowed them by law. The printing, photolithographing, and engrossing of the several patent parts, preparatory to final signing and sealing, will consume the intervening time, and such work will not be done until after payment of the necessary fees.

When you send the final fee you will also send, Distinctly and Plainly Written, the name of the Inventor and Title of Invention as Above Given, Date of Allowance (which is the date of this circular), Date of Filing, and, if assigned, the Names of the Assignees.

If you desire to have the patent issue to Assignees, an assignment containing a Request to that effect, together with Fee for recording the same, must be filed in this office on or before the date of payment of final fee.

Additional copies of Specifications and Drawings will be

charged for at the following rates: Single Copies, uncertified, 5 cents each. The money should accompany the order.

Very respectfully,

F. I. ALLEN,
Commission of Patents.

After allowance, and prior to payment of the final fee, applicants should carefully scrutinize the description to see that their statements and language are correct, as mistakes not incurred through the fault of the office, and not affording legal grounds for reissues, will not be corrected after the delivery of the letters patent to the patentee or his agent.

(Printed in left-hand margin) ☞In remitting the final fee give the serial number at the head of this notice.

(Stamped in right-hand margin) ☞If payment is made by check or draft, the credit allowed is subject to the collection of the same.

U. S. Patent Office
Jun 2 1904
Division 36.
$15 Received
Ck May 31 1904 z
Chief Clerk, U. S. Patent Office.

Serial No. 210406 Paper No. 5
Letter of Renewal

IN THE UNITED STATES PATENT OFFICE.

Allen DeVilbiss, Jr.,
Computing Scales,
Filed April 9th, 1901,
Serial No. 55,007.

Hon. Commissioner of Patents:

Your petitioner respectfully prays that the above entitled application may be renewed, and that the petition, oath, specification, claims and drawings of said application may be accepted and used as the petition, oath, specification, claims and drawings of the renewed application; the renewal fee of $15.00 being filed herewith.

Very respectfully,

ALLEN DE VILBISS JR
Applicant.

Mail Room
May 31 1904
U. S. Patent Office

U. S. Patent Office
June 2 1904
Division 36.

Serial No. 210,406
Paper No. 6
Power of Atty

IN THE UNITED STATES PATENT OFFICE.

Allen De Vilbiss, Jr.,
Computing Scales,
Filed April 9th, 1901,
Serial No. 55,007.

Hon. Commissioner of Patents,
Sir:

We hereby revoke all powers of attorney heretofore given in the above application and appoint Messrs. Rector & Hibben (a firm composed of Edward Rector and Samuel E. Hibben) No. 1625 Monadnock Building, Chicago, Illinois, our attorneys to prosecute said application and any renewals thereof, to make alterations and amendments therein, to receive the patent and to prosecute all business connected with said application in the Patent Office; and request that all communications concerning said application be addressed to them.

ALLEN DE VILBISS JR
Applicant.
TOLEDO COMPUTING SCALE COMPANY
By HENRY THEOBALD
Gen'l Mgr.
Assignee of entire title to Application.

(Company Seal)

Mail Room
Jun 6 1904
U. S. Patent Office.
Cls

U. S. Patent Office
Jun 7 1904
Division 36.

Serial No. 210,406
Paper No. 7
Amendment C
*(1 to 15)
None

Room 322.
A DeVilbiss, Jr.
Computing Scales.
Filed May 31, 1904.
Serial Number 210,406, Renewal.

Chicago, 3 June, 1904.

Hon. Commissioner of Patents,
Washington.
Sir:

In the matter of the above entitled application, which is a

*Matter in italics in parentheses, stricken out in original transcript.

renewal of applicant's original application filed April 9, 1901, Serial Number 55,007, and allowed on June 3, 1902, we hereby amend by inserting the following claims, the original claims of said application to be renumbered to follow the claims herewith submitted:

V

per D

Sub. E'

C'

Insert D'

per D

Insert D²

*(*1. A computing scale comprising an indicating device, a pivoted scale beam operatively connected* †independent of the counter-balancing means *therewith*∧, *a platform pivoted on the beam intermediate its pivotal point and its connection with the indicating device, and means for counterbalancing the weight of the article whose price is to be computed.*

2. A computing scale comprising an indicating device, a pivoted scale beam operatively connected therewith, a platform pivoted on the beam, means connected with the beam for counterbalancing the weight of the article whose price is to be computed, the connections of the beam with the indicating device and the platform being on the same side of the pivotal point of the beam.

3. A computing scale comprising an indicating device, a scale beam operatively connected therewith, a counterbalancing pendulum cooperating with the beam, and a platform pivoted on said beam∧.

4. A computing scale comprising a price indicating drum or cylinder, a platform to receive the article, a pivoted scale beam ∧ †pivotally *supporting the platform and operatively connected with the drum, and means for counterbalancing the weight of the article.*

5. A computing scale comprising a price indicating drum or cylinder, a platform to receive an article, a scale beam supporting the platform and operatively connected with the drum, and a pendulum connected with the scale beam for counterbalancing the weight of the article∧.

>

6. A computing scale comprising a scale beam, a platform pivoted thereto and arranged to receive an article, a price indicating drum or cylinder to which

*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

the scale beam is operatively connected, and means for counterbalancing the weight of the article.

Insert D[2] >

7. A computing scale comprising a platform to receive an article, a scale beam supporting the platform, means †connected with the beam ^ *for counterbalancing the weight of the article, and a price indicating drum or cylinder arranged transversely of the longitudinal axis of the scale beam and to which such beam is operatively connected.* ^

Insert D[3] >

8. A computing scale comprising a price indicating drum or cylinder, a platform to receive the article whose price is to be computed, a scale beam ^ †pivoted at its outer end and near that *(at one) end pivotally connected with such platform* †near *and (at) the other end operatively connected with said drum or cylinder, and means for counterbalancing the weight of the article.*

9. A computing scale comprising a price indicating drum or cylinder, a platform to receive the article whose price is to be computed, means for counterbalancing the weight of the article, a scale beam at one end pivotally connected with said platform and at the other end operatively connected with said drum and with said counterbalancing means.

10. A computing scale comprising a base, a frame rising from said base from one end thereof, a price indicating drum or cylinder mounted to rotate on said frame, a support arranged at the opposite end †its outer *of said base, a scale beam pivoted at* ^ *(one) end on said support and extending toward the other end of the base and there operatively connected with the drum, a platform supported on said beam, and adapted to receive the article whose price is to be* †connected with the inner end of the beam *computed, and means* ^ *for counterbalancing the weight of the article.*

11. A computing scale comprising a base, a frame rising from said base from one end thereof, a price

*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

per D *indicating drum or cylinder mounted to rotate on said frame, a support arranged at the opposite end* †*its outer* *of said base, a scale beam pivoted at (one)* ^ *end on said support and extending toward the other end of the base and there operatively connected with the drum, a platform supported on said beam and*

per D *adapted to receive the article whose price is to be* †*connected with the inner end of the beam* *computed, and means* ^ *for counterbalancing the weight of the article, the axis of said drum being at right angles to the longitudinal axis of the scale beam.*

12. A computing scale comprising a price indicating drum or cylinder, a pivoted scale beams operatively connected with said drum, a platform pivoted on the beam intermediate its pivotal point and its connection with the drum, and means for counterbalancing the weight of the article whose weight is to be computed.

13. A computing scale comprising a price indicating drum or cylinder, a scale beam pivoted at one end and operatively connected at its other end with the drum, a platform pivoted on the beam toward its pivotal point, and means for counterbalancing the weight of the article whose weight is to be computed.

14. A computing scale comprising a price indicating drum or cylinder, a pivoted scale beam operatively connected intermediate its length with said drum, a platform pivoted on the beam, and means connected with the beam beyond its connection with the drum for counterbalancing the weight of the article whose weight is to be computed.

15. A computing scale comprising a price indicating drum or cylinder, a pendulum, a scale beam pivoted at one end and connected at its opposite end with the pendulum, said beam being operatively connected, intermediate its pivotal point and its connection with the pendulum, with said drum.

Respectfully,

RECTOR & HIBBEN
Attorneys for Applicant.

*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

2—260

Div. 36, Room 322.
Address only
"The Commissioner of Patents,
Washington, D. C."

Paper No. 8.
All communications respecting this application should give the serial number, date of filing, and title of invention.

M. E. P.

DEPARTMENT OF THE INTERIOR.
United States Patent Office
Washington, D. C., June 20, 1904.
Mailed " " "

Allen De Vilbiss, Jr.,
Care Rector & Hibben,
Chicago, Ill.

Please find below a communication from the Examiner in charge of your application.

Serial No. 210,406, renewal filed May 31, 1904, for Computing Scales.

F. I. ALLEN,
Commissioner of Patents.

The above-named case, as amended June 6, 1904, has been examined.

Claims 8 and 12 are inconsistent with each other in their definition of the location of the platform with reference to end of beam. Claims 14 and 15 are inconsistent with claims 8 and 9 in their definitions of the location of the "drums" with reference to ends of beam.

Claims 1 to 3, inclusive, are each rejected upon the patent to De Vilbiss, No. 667,652, Feb. 5, 1901, Price Scales.

Claims 4 to 9, inclusive, are each rejected upon the patent to Lake, No. 55503, June 12, 1866, Price Scales.

Claims 10 to 13, inclusive, are each rejected upon the patent to Lake, cited, which shows each of the elements of each of the claims, in view of the patent to De Vilbiss, cited, which shows the relative arrangement of the platform and scale beam bearing, the only feature in which the claims otherwise distinguish from Lake.

Claims 14 and 15 are each rejected upon the patent to Keeler, No. 297,267, Apr. 22, 1884, Pendulum Scales. In view of the common use of computing drums with every type of

weighing scales, it would not involve invention to substitute computing mechanism of the drum type for Keeler's "indicating mechanism."

GEO. L. MORTON
Examiner, Div. 36.

Spencer

Mail Room
Jun 15 1905
U. S. Patent Office.

U. S. Patent Office
Jun 16 1905
Division 36.

Serial N. 210,406
Paper No. 9
Amendment. D
√ Claim *(*23 15*)

Room 322.
A. DeVilbiss, Jr.
Computing Scales.
Renewed May 31, 1904.
Serial No. 210,406.

Chicago, June 12, 1905.

Hon. Commissioner of Patents,
Washington, D. C.

Sir:

Referring to official letter of June 20, 1904, we amend as follows:

√After "therewith" in the second line of claims 1 and 2, insert:

"independently of the counterbalancing means,"

√At the end of claim 3 add:

D¹ "said beam being connected with the indicating device independently of the pendulum."

√In claim 4, line 3, after "beam" insert:

"pivotally."

√At the end of claims 5 and 6 add:

D² "said platform being pivoted on the beam on that side of its pivotal point adjacent the indicating drum."

√In claim 7, line 2, after "means" insert:

"connected with the beam."

√At the end of claim 7 change the period to a comma and add:

D³ "the connection of the beam with the drum being inter-

*Matter in italics in parentheses, stricken out in original transcript.

mediate its pivotal point and connection with the counterbalancing means.

√In claim 8 line, 3, erase "at one" and insert: "pivoted at its outer end and near that."

√In same claim, line 4, change "at" to "near."

√In the fourth line of claims 10 and 11 change "one" to "its outer."

√After "means" in line 8 of claims 10 and 11, insert: "connected with the inner end of the beam."

√We submit the following claim for consideration:

Erased pr F D⁴

*(*15e* "*23. A computing scale comprising an indicating device, a pivoted scale beam or lever operatively connected therewith and counterbalancing means co-operating with the scale beam, said indicating device comprising a drum contained within a casing and bearing a series of figures arranged to be exhibited through openings in the casing, certain of the figures being inverted with respect to the remainder in order to permit their reading from the opposite side of the casing.*")

Claims 1 to 3 which have been rejected upon applicant's prior patent have been amended in such manner as to clearly differentiate therefrom by the statement, inserted by amendment, that the scale beam or lever is operatively connected with the indicating device independently of the counterbalancing means. In applicant's prior patent, this connection is through the medium of the upper end of the counterbalancing means, whereas in the present construction the connection is direct from the scale beam to the indicating device. An allowance of these claims as now presented is solicited.

With regard to claims 4 to 9, we have amended all of these claims, with the exception of claim 9, which, we think, is allowable in its present condition. We submit that this series of claims represents patentable subject matter which can be clearly differentiated from the Lake patent, for several reasons. First, in the Lake patent the load platform is not pivotally connected with the scale beam or lever; second, the load platform is not connected with the scale beam (pivotally or otherwise) at a point intermediate the pivotal point of the scale beam and the indicating device, but at the outer end

*Matter in italics in parentheses, stricken out in original transcript.

thereof; and third, there is no pendulum device which is connected with the scale beam at its inner end beyond the connection of such beam with the indicating device. One or more of these features of difference are brought out in the different claims and such differences are certainly sufficient to warrant favorable action on these claims.

With regard to claims 10 to 13, we have amended claims 10 and 11, but respectfully ask a reconsideration as to claims 12 and 13. Claims 10 and 11 have been amended so as to specify the particular points of connection and pivoting of some of the parts, which amendments will, we think serve to clearly differentiate over the two references cited separately or collectively considered. The subject matter of claims 12 and 13, which is limited to applicant's construction and cooperation of the drum, scale beam, platform and counterbalancing means, is clearly different from that disclosed in the patent cited and we think therefore that these claims should be allowed as presented. We note from the double citation of references to claims 10 to 13, that the Examiner is unable to find in the prior art any one patent showing or suggesting the novel and original construction and arrangement of parts constituting applicant's scale, and in view of the fact, as the Examiner is well aware, that differences in the method of arrangement and the particular point or manner of pivoting make considerable difference in the result, applicant is entitled to much consideration and should be given the benefit of any doubt that may arise in Examiner's mind as to the patentability of the claims. In passing upon the question of invention, it must be borne in mind that the solution of the problem is disclosed to the Patent Office in applicant's application, so that it is perhaps somewhat difficult, after such disclosure, to really appreciate the problem which confronted applicant and perhaps to give full credit to applicant's claim of invention. But in the art of scales more particularly, where, as above suggested, small differences may cause great results, we should be given the benefit of the doubt, which certainly must arise from a mere consideration of the Lake and DeVilbiss patents. Further and favorable consideration of these claims, in view of the above, is therefore respectfully solicited.

With regard to claim 14 and 15, we respectfully ask a reconsideration on the ground that the Keeler patent does not show or suggest the subject matter of these claims. We note that the Examiner concedes that the Keeler patent does not show

a computing drum, but this is only one element of the claims which are for combinations, besides which it is not common, as might be inferred from the Examiner's statement, that computing drums are used with every type of weighing scales. Not only this, but it is quite evident that even if a computing drum was substituted for Keeler's indicating mechanism, an operable and successful computing scale would not be produced, for the Keeler structure and arrangement of parts are not such as would permit of the transfer bodily of a drum, as a substitute for his indicating mechanism. It is obvious that such transfer and substitution would involve an absolute reconstruction of his entire scale. Furthermore, the Keeler patent does not answer the requirements of these claims in other respects, but we think it sufficient to base the request for consideration on the grounds above noted.

An allowance of the case as now presented is solicited.

Respectfully,

RECTOR & HIBBEN
Attorneys for Applicant.

2—260

Div. 36 Room 322
Address only
"The Commissioner of Patents,
Washington, D. C."

Paper No. 10.
All communications respecting this application should give the serial number, date of filing, and title of invention.

N A E

DEPARTMENT OF THE INTERIOR
United States Patent Office
Washington, D. C., July 25, 1905.
Mailed " " "

Allen DeVilbiss, Jr.,
Care Rector & Hibben,
16254 Monadnock Bldg, Chicago Ill.

Please find below a communication from the Examiner in charge of your application for "compIting Scales", renewed May 31, 1904, Ser. No. 210,406

F. I. ALLEN
Comissioner of Patents.

The above-named case, as amended on June 15, 1905, has been examined.

Claims 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 14 and 15 are rejected

on Keeler of record in view of patent to Lake, of record; or patent 597,300, Smith, Jan. 11, 1898, Price Scales. To substitute a price drum for the pointer and scale shown by Keeler would be merely a substitution of equivalents.

Claims 9, 12, and 13 are rejected on patent to Lake in view of DeVilbiss, of record.

Claims 10 and 11 refer to one end of the scale beam and the other end of the base, which is objectionable.

Claim 13 is incorect as the drum is not connected with the end of the scale beam.

Claim 23 is rejected on Lake in connection with Smith.

GEO. L. MORTON
Examiner, Div. 36.

E. C.

Mail Room
Nov 3 1905
U. S. Patent Office
Room 322

U. S. Patent Office
Nov 4 1905
Division 36.

Serial No. 210,406
Paper No. 11
Amendment. E
*(*1 to 7*)

A. De Vilbiss, Jr.
Computing Scales.
Renewed May 31, 1904.
Serial No. 210,406.

Chicago, Ill, Oct. 31, 1905

Hon. Commissioner of Patents,
Washington, D. C.

Sir:

Referring to official letter of July 25, 1905, we amend as follows:

Erase claims 1 to 15 and substitute the following changing the ordinals of the succeeding claims by reducing them by eight.

E'

Sub

*("*1. A computing scale comprising a base, an indicating device supported thereupon, automatic mechanism for counterbalancing the weight of the article whose price is to be computed, a scale lever pivotally mounted on the base and connected at one end with such counterbalancing mechanism, a platform pivotally mounted on the lever intermediate the pivotal point of the latter and said counterbalancing mechanism, and an operating connection between the indicating device and the lever at a point between

*Matter in italics in parentheses, stricken out in original transcript.

F' *the pivot of the latter and its connection with the counterbalancing mechanism.*

2. A computing scale comprising a base, an indicating drum or cylinder supported thereon, automatic mechanism for counterbalancing the weight of the article whose price is to be computed, a scale lever pivotally mounted on the base and connected at one end with such counterbalancing mechanism, a platform pivotally mounted on the lever intermediate the pivotal point of the latter and said counterbalancing mechanism, and an operating connection between the drum and the lever at a point between the pivot of the latter and its connection with the counterbalancing mechanism.

3. A computing scale comprising a base, an indicating device supported thereupon, a counterbalancing pendulum co-operating with the lever for counterbalancing the weight of the article whose price is to be computed, a scale lever pivotally mounted on the base and connected at one end with such pendulum, a platform pivotally mounted on the lever intermediate the pivotal point of the latter and said pendulum, and an operating connection between the indicating device and the lever at a point between the pivot of the latter and its connection with the pendulum.

4. A computing scale comprising a base, an indicating drum or cylinder, a frame or housing for the drum and mounted on said base, a lever support on the base, a scale lever mounted at its outer end on said lever support, automatic counterbalancing means connected with the inner end of the scale lever, and an operating connection between the lever and the drum.

5. A computing scale comprising a base, an indicating drum or cylinder, a frame or housing for the drum and mounted on said base, a lever support on the base, a scale lever mounted at its outer end on said lever support, automatic counterbalancing means connected with the inner end of the scale lever, and an operating connection between the lever and drum, said drum being arranged in a plane at

*Matter in italics in parentheses, stricken out in original transcript.

right angles to the scale lever and transversely thereof.

6. A computing scale comprising a base, an indicating drum or cylinder, a frame or housing for the drum and mounted on said base, a lever support on the base, a scale lever mounted at its outer end on said lever support, automatic counterbalancing means connected with the inner end of the scale lever, and an operating connection between the lever and drum, said lever being arranged transversely of the longitudinal axis of the drum and centrally thereof.

7. A computing scale comprising a base, an indicating drum or cylinder, a frame or housing for the drum and mounted on said base, a lever support on the base, a scale lever mounted at its outer end on said lever support, automatic counterbalancing means connected with the inner end of the scale lever, pinions at each end of the drum for operating the latter and a pair of racks engaging said pinions and operatively connected with the scale lever.'')

Although claims 1 to 15 were, in our judgment, patentable as they originally stood yet we have chosen to re-draft the subject matter thereof and to present the same in the above submitted seven claims, our object being to present the invention in better and revised form. We submit that these claims are allowable and a favorable consideration thereof is solicited in view of the following argument:

In the rejection of the original claims 1 to 15 the Examiner has referred more particularly to three patents to-wit, the Keeler patent, the Lake patent and the Smith patent, holding that applicant's invention represented merely a substitution of a price drum for the pointer and scale shown by Keeler. This is a very common method of rejection of claims for an invention but such method is always open to the observation, as is the fact in the present case, that an invention after being made and disclosed seems obvious and the wonder is that it was never made before, but this does not detract from the merit and character of the invention. In the present instance, notwithstanding the fact that drum scales were old and platforms were old and while such scales had in fact been old for a great length of time, yet no one seemed able to devise ap-

*Matter in italics in parentheses, stricken out in original transcript.

plicant's combination which is made the subject matter of the present application, such combination comprising essentially the indicating device, counterbalancing device, scale lever pivotally mounted on the base and connected with the counterbalancing device, the platform pivotally mounted on the lever and also an operating connection between the indicating device and the lever. Not only this but the construction represented by the patents cited do not disclose or hint at the combination devised by applicant for notwithstanding the statement of the Examiner in regard to substitution, as above referred to, such alleged substitution is not an apparent or obvious one and in our judgment such substitution could not be made without requiring an absolute re-construction amounting to invention. If this substitution was an obvious one and if the device of one construction could be bodily transferred and caused to operate with the same results in the place to which it has been transferred or transplanted, there might be some force in the Examiner's argument but this is not the case in the present instance particularly for the reason that such substitution is impossible without reconstruction. Moreover the Examiner should, we think, bear in mind that the proposition that a device or invention merely involves a substitution is in most cases wisdom after the event and consequently the Examiner should keep in view the fact that the invention has now been disclosed to him so that it might be quite apparent to him after being made whereas the problem might have remained unsolved even with the patents cited before him.

It is quite evident from the form of the rejection that no one of the patents is relied upon to meet the claims but that they have been considered collectively but we submit that these patents whether so considered or considered separately are not sufficient to meet applicants invention.

Referring first to the Keeler patent, this patent exhibits a construction of scale which is quite different from that of applicant for while it is a pendulum scale yet it differs as regards the indicating device and as regards the arrangement and relationship of the platform and scale lever. Referring next to the Lake patent, this patent is not pertinent particularly for the reason that the scale platform is not pivoted to the scale lever and also for the reason that the connection between the platform and scale lever is at a point different from that called for in the claims. Furthermore the scale lever is connected directly to the indicating device by means

of gearing and not through the medium of operating connections. Again, the Lake scale does not employ a counterbalancing mechanism at a point on the scale lever beyond the point of connection of the operating device with such scale lever. Finally the scale lever of the Lake patent is not positioned in the same relation to the drum as in applicant's construction where as seen more particularly in Fig. 3 such scale lever, which is at right angles to the longitudinal axis of the drum, is arranged substantially central of such axis. For these reasons we submit that this patent is not pertinent particularly against the claims as now presented.

With regard to the Smith patent there is nothing in this patent to suggest applicant's invention and apparently the only object of the Examiner in citing it is to illustrate a drum form of scale but as we are not claiming such a feature broadly but only as one element of the combination we submit that the reference is not pertinent and has no bearing or application against the combination claims which must be attacked in their entirely and not in piece-meal fashion.

In view of the foregoing further and favorable consideration of the case as now presented is solicited.

Respectfully,

RECTOR & HIBBEN
Attorneys for Applicant.

2—260

Div. 36 Room 322
Address only
"The Commissioner of Patents,
Washington, D. C."

Paper No. 12
All communications respecting this application should give the serial number, date of filing, and title of invention.

N A E

DEPARTMENT OF THE INTERIOR
United States Patent Office

Washington, D. C., Nov. 21, 1905
Mailed " " "
Division 36

Allen DeVilbiss, Jr.,
Care Rector & Hibben,
1625 Monadnock Bldg., Chicago, Ill.

Please find below a communication from the Examiner in

charge of your application for Computing Scales, filed Apr. 9, 1901, renewed May 31, 1904, Serial No. 210,406.

F. I. ALLEN
Commissioner of Patents.

This action is in response to your amendment filed Nov. 3, 1905.

Claims 1 and 3 are rejected on Keeler, of record. To omit the part of the lever a to the left of its pivot would not involve invention when its function is also omitted.

Claims 2, 4, 5 and 6 are rejected on Keeler in view of Lake, of record. Lake shows an indicating drum operated by a scale beam. To use such a drum in place of Keeler's pointer and scale would be a substitution of equivalents.

Claim 7 is rejected on Keeler, in view of Smith, of record.

Claim 15 is rejected on Lake in view of Smith, of record.

E. C.

GEO. L. MORTON
Examiner, Div. 36.

U. S. Patent Office Serial No. 210,406 Paper No. 13.
Nov 21 1906
Division 36.
Room 322.
A. DeVilbiss, Jr.
Computing Scales.
Renewed May 31, 1904.
Serial No. 210,406.

Power of Attorney.

Toledo Computing Scale Company, assignee of the entire right, title and interest in and to the above entitled application, hereby appoints Rector, Hibben & Davis, a firm composed of Edward Rector, Samuel E. Hibben and Frank Parker Davis, of 1625 Monadnock Building, Chicago, Illinois, its attorneys with full power of substitution and revocation to prosecute said application, to make alterations and amendments therein and to transact all business in the Patent Office connected therewith; all powers of attorney heretofore given being hereby revoked.

TOLEDO COMPUTING SCALE COMPANY.
By HENRY THEOBALD
Gen'l Mgr.

Chicago, Ills., Nov. 13th, 1906.

(Endorsed) Accepted Nov 21 1906 F. I. Allen Commissioner. Docket Clerk Nov 21 1906 U. S. Patent Office.

2—069.

E.G.E.

Serial No. 210,406 Paper No. 14

All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

DEPARTMENT OF THE INTERIOR,
United States Patent Office,
Washington, D. C.,
November 22, 1906.

Sir:

You are hereby informed that Your Power of Attorney Has Been Revoked in the matter of the application of Allen De Vilbiss, Jr. for Letters Patent for an Improvement in Computing Scales No. 210,406. Filed May 31, 1904.

Very respectfully,

F. I. ALLEN,
Commissioner.

Collamer & Co.,
Washington, D. C.

2—070.

E.E.G.

All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

DEPARTMENT OF THE INTERIOR,
United States Patent Office,
Washington, D. C., Nov. 22, 1906,

Sir:

You are hereby informed that Your Power of Attorney Has Been Accepted in the matter of the application of Allen De Vilbiss, Jr. for Letters Patent for an Improvement in Computing Scales No. 210,406. Filed May 31, 1904.

Very respectfully,

F. I. ALLEN,
Commissioner of Patent.

Rector, Hibben & Davis,
1625 Monadnock Bldg.,
Chicago, Ill.

U. S. Patent Office
Nov. 21, 1906.
Division 36

U. S. Patent Office
Counted
Nov. 22, 1906.
Division 36.

Serial No. 210,406
Paper No. 15
Amendment. F

Cls

Allen DeVilbiss Jr. 1
Computing Scales. 2
Filed April 9, 1901. 3
Renewed May 31, 1904. 4
Serial No. 210,406.

Chicago, November 16, 1906.

Hon. Commissioner of Patents,
Washington, D. C.

Sir:—

In the matter of the above application, amendment is hereby made as follows:

√Cancel claims 1-7 and claim 15 and insert the following: What is claimed as new is—

1. In computing scales, the combination of a supporting base, a scale beam pivoted at or near one of its ends on said base, a platform pivotally mounted upon said beam inwardly beyond the latter's pivot, a substantially cylindrical casing mounted at an elevated position in rear of the platform over the rear end of the scale-beam and transverse thereto, said cylindrical casing being apertured in the side toward said platform above the plane of the top of the latter, a drum journaled in said casing with
F' its axis transverse the beam and the latter centrally located with reference to said axis, said drum bearing weight and price inscription to show through said apertures of the casing, a gear wheel secured to the drum, a rack bar meshing with said gear wheel and pivotally connected with the scale-beam where the latter extends below the drum, and load-counterbalancing means connected with the scale-beam in rear of the pivotal support thereon for the platform.

2. In computing scales the combination of a supporting base, a scale-beam pivoted at or near one of its ends on said base, a platform pivotally mounted upon said beam inwardly beyond the latter's pivot, a substantially cylindrical casing mounted at an elevated position in rear of the platform over

the rear end of the scale-beam and transverse thereto, said cylindrical casing being apertured in the side toward said platform above the plane of the top of the latter, a drum journaled in said casing with its axis transverse the beam and the latter centrally located with reference to said axis, said drum bearing weight and price inscriptions to show through said apertures of the casing, gear wheels secured to opposite ends of the drum, rack bars meshing with said gear wheels respectively and pivotally connected with the scale beam where the latter extends below the drum, and load-counterbalancing means connected with the scale-beam in rear of the pivotal support thereon for the platform.

3. In computing scales, the combination of a suitable supporting base, a transversely extending slotted cylindrial casing supported in elevated position at the rear part of said base, a rotary indicating drum or cylinder within said casing, a scale beam or lever fulcrumed at or near one of its ends on the forward part of the supporting base and extending rearwardly at right angles to the axis of the said drum or cylinder to a point below the middle of the latter, a gear wheel carried by said cylinder, a rack bar engaging said wear wheel, means pivotally connecting the rack bar with the scale beam where the latter extends below the cylinder, a platform pivotally supported upon said scale beam in rear of the latter's fulcrum and centrally located in front of the indicating cylinder below the slots in the latter's casing, and means operating automatically to counterbalance that portion of the scale beam extending in rear of its fulcrum and the parts connected therewith which tend to depress it thus normally maintaining the indicating cylinder at zero position, with provisions for a varying automatic augmentation to counterbalance varying loads placed upon the platform and to correspondingly limit the resultant rotation of the cylinder so that the correct indication of weight and price may be exhibited through the slots of the casing.

4. In computing scales, the combination of a suitable supporting base, a transversely extending slotted cylindrical casing supported in elevated position at the rear part of said base, a rotary indicating drum or cylinder within said casing, a scale beam or level fulcrumed at or near one of its ends on the forward part of the supporting base and extending rearwardly at right angles to the axis of the said drum or cylinder to a point below the middle of the latter, gear wheels carried by the cylinder at its opposite ends, rack bars con-

nected together to operate in unison and engaging said gear wheels respectively, means pivotally connecting the racks bars with the scale beam where the latter extends below the cylinder, a platform pivotally supported upon said scale beam in rear of the latter's fulcrum and centrally located in front of the indicating cylinder below the slots in the latter's casing, and means operating automatically to counterbalance that portion of the scale beam extending in rear of its fulcrum and the parts connected therewith which tend to depress it, thus normally maintaining the indicating cylinder at zero position, with provisions for a varying automatic augmentation to counterbalance varying loads placed upon the platform and to correspondingly limit the resultant rotation of the cylinder so that the correct indication of weight and price may be exhibited through the slots of the casing.

This amendment is made in response to official communication of November 21, 1905. The references cited therein have been given careful consideration as also references previously cited in the case. The rejected claims have been cancelled and four new claims are submitted herewith which are thought to remove any possible question as to pertinency of the references. It must, we believe, be conceded that the Examiner has brought forward no reference which shows a scale made up as recited in these claims. There is no reference showing scales in which the platform stands in front of a computing drum centrally located with reference to the same, said platform being supported upon an intermediate part of a scale beam which extends rearwardly below the centre of the drum and is operatively connected therewith through the medium of a rack bar and pinion in the manner set forth in said claims. That this combination provides an eminently practical and efficient form of computing scales must be apparent. The relative location of the platform and the indicating drum, the particular manner of mounting the platform with reference to the fulcrum of the beam and the specified character of operating connections between the beam and the cylinder, all as clearly set forth in the above claims, unquestionably combine to fully satisfy the exacting requirements of computing scales. The circumstance that it may be possible to point out here and there among a considerable number of patents in the prior art the various elements of the combinations claimed is not of course a sufficient reason for denying patentability to the new combinations.

As said by the Court of Appeals for the Third Circuit in McMichael and Wildman Manufacturing Company vs. Ruth, et al., 128 F. R. 706,

"although it is perhaps possible for an expert, having the patent in suit before him, to build up the structure covered by these claims, by selecting and deftly adapting appliances theretofore known, 'yet it would still be true that neither the same combination in its entirety nor the same mode of operation' had previously been described or in any manner exemplified."

And further:

"This art had been already highly developed, and these patentees brought to it nothing of a fundamental character, but they did, by their 'improvements,' create a construction which had never before existed, which has proved to be commercially successful."

Reconsideration of the case as now presented is requested.

Respectfully,

RECTOR, HIBBEN & DAVIS,
Attorneys for Applicant.

2—075.

DEPARTMENT OF THE INTERIOR,
United States Patent Office,
Washington, D. C., Nov. 21st, 1906.

To the Chief of the Assignment Division:

You will please make a statement of what is shown in the "Assignment Records" relating to the condition of the title to the alleged invention involved in the application referred to in the paper hereto annexed. You will attach such statement to such annexed paper and transmit the same to the "Docket Clerk" on or before the ..... day of ....., 190....

F. I. ALLEN,
Commissioner of Patents.

2—405.

No further assignments found of record affecting this application:
Serial No. 210,406.
Inventor, A. De Vilbiss, Jr.
Examined up to and including Nov. 15, 1906.
This certificate dated Nov. 21, 1906.

W. B. MAGRUDER,
Chief of Div. D.

Remarks:
No further Assignments appear to have been received for record including Nov. 20, 1906.
K&H.
Docket Clerk Room.
$20 Received
z Dec. 6 1906
Chief Clerk, U. S. Patent Office.

2—327.

Memorandum
of
Fee Paid at United States Patent Office.

(Be careful to give correct Serial No.)

1901

Serial No. 210,406.
Inventor, Allen De Vilbiss, Jr.
Patent to be issued to Assignee.
Name of Invention, as allowed, Computing Scales.
Date of payment, Dec. 6, 06.
Fee, $20.
Date of filing, April 9, 1901.
Date of circular of allowance, Dec. 6, 06.
The Commissioner of Patents will please apply the accompanying fee as indicated above.

RECTOR, HIBBEN & DAVIS,
Attorney.

Send patent to
Rector, Hibben & Davis,
1625 Monadnock Bldg.,
Chicago, Ill.

2—182.

CRA 210,406

Issue Division.
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

DEPARTMENT OF THE INTERIOR,
United States Patent Office,
Washington, D. C., Dec. 8, 1906.

Allen De Vilbiss, Jr., Assor.,
C/o Rector, Hibben & Davis,
Chicago, Ill.

Sir:

Your Application for a patent for an Improvement Computing Scales, filed May 31, 1904, has been examined and Allowed.

The final fee, Twenty Dollars, having been received, the Letters Patent will be forwarded in due course of business.

Additional copies of Specifications and Drawings will be charged for at the following rates: Single copies, uncertified, 5 Cents Each. The money should accompany the order.

Very respectfully,

F. I. ALLEN,
Commissioner of Patents.

73 Measuring Instrumests
Price Scales.

1901

Contents:

½.	Application 1 paper*(*s*) O. K.	
√1.	Rejection	May 4, 1901.
√2.	Amendt A	May 10, 1901.
√3.	Rejection	May 24, 1901.
√4.	Amendt., B	May 23, 1902.
5.	Letter of Renewal	May 31/04.
6.	Power of Atty	May 31/04.
√7.	Amendt. C	June 6/04.
√8.	Rejection	June 20, 1904.
√9.	Amendt. D	June 15/05.
√10.	Rejection,	July 25, 1905.
√11.	Amend't E	Nov. 3, 1905.
√12.	Rejection,	Nov. 21, 1905.
13.	Rev & Power of Atty by assee	Nov. 21, 1906.
14.	Notice of Rev. and Accept.	Nov. 22, 06.
√15.	Amendt. F	Nov. 21, 1906.
16.		
17.		
18.		
19.		
20.		
21.		
22.		
23.		

Title:

Improvement in
Computing Scales.

(Endorsed) Filed Jun 13 1912 at ..... o'clock .....M. T. C. MacMillan, Clerk.

U. S. Circuit Court,
N. D. of Ill.

Computing Scale Co., } In Equity,
vs. } No. 30,024.
Toledo Computing Scale Co. }

COMPLAINANT'S EXHIBIT ARTICLES OF INCORPORATION.

(Seal) Annie C. Courtenay
Chicago, March 29, 1911. *Notary Public.*

*Matter in italics in parentheses, stricken out in original transcript.

13. These Article of Incorporation

—of—

The Computing Scale Company,

Witnesseth, That we, the undersigned, all of whom are citizens of the State of Ohio, desiring to form a corporation, for profit, under the general corporation laws of said State, do hereby certify:

First: The name of said corporation shall be The Computing Scale Company.

Second. Said corporation is to be located at Dayton, in Montgomery County, Ohio, and its principal business there transacted.

Third. Said corporation is formed for the purpose of manufacturing, selling and dealing in scales and store supplies of all descriptions, and other store appliances, and material for the same and to all things incident thereto for profit.

Fourth. The capital stock of said corporation shall be One Hundred and Sixty Thousand Dollars ($160,000.00), divided into Sixteen Hundred (1600) shares of One Hundred Dollars ($100.) each.

In Witness Whereof, We have hereunto set our hands, this Nineteenth day of March, A. D. 1891.

EDWARD CANBY
O. O. OZIAS
DANIEL BERGER
FERDINAND J. ACH
FRANK L. CANBY

The State of Ohio, } ss.
County of Montgomery, }

Personally appeared before me, the undersigned, a Notary Public in and for said county, this 19th day of March, A. D. 1891, the above named Edward Canby, O. O. Ozias, Daniel Berger, Ferdinand J. Ach, and Frank L. Canby, who each severally acknowledged the signing of the foregoing articles of incorporation to be his free act and deed, for the uses and purposes therein mentioned.

Witness my hand and official seal on the day and year last aforesaid.

(Seal)

BENJAMIN F. MCCANN,
Notary Public in & for Montgomery County, Ohio.

The State of Ohio,
County of Montgomery, } ss.

I, F. K. Bowles, Clerk of the Court of Common Pleas, within and for the county aforesaid, do hereby certify that Benjamin F. McCann, whose name is subscribed to the foregoing acknowledgment as a Notary Public, was at the date thereof a Notary Public, in and for said county, duly commissioned and qualified, and authorized as such to take said acknowledgment; and further, that I am well acquainted with his handwriting, and believe that the signature to said acknowledgment is genuine.

In Witness Whereof, I have hereunto set my hand and affixed the seal of said Court, at Dayton, Ohio, this 19th day of March, A. D. 1891.

F. K. Bowles,
(Seal) *Clerk.*

(Certificate under Section 906, Revised Statutes of the United States.)

United States of America,
State of Ohio,
Office of the Secretary of State. }

I, Chas. H. Graves, Secretary of State of the State of Ohio, and being the officer who, under the Constitution and Laws of said State, is duly constituted the keeper of the records of articles of incorporations of all companies incorporated under the laws thereof, and the records of all papers relating to the creation of said incorporated companies, and empowered to authenticate exemplifications of the same, do hereby certify that the annexed instrument is an exemplified copy, carefully compared by me with the original record now in my official custody as Secretary of State, and found to be true and correct, of the Articles of Incorporation of "The Computing Scale Company," filed in this office on the 20th day of March, A. D. 1891, and recorded in Volume 52, Page 91, of the Records of Incorporations; that said exemplification is in due form and made by me as the proper officer, and is entitled to have full faith and credit given it in every court and office within the United States.

In Testimony Whereof, I have hereunto attached my official signature and the Great Seal of the State of Ohio, at Columbus, this 9th day of February, A. D. 1911.

CHAS. H. GRAVES
Secretary of State.

(Seal)

(Endorsed) Filed Jun 13 1912 At ..... O'clock .....M.
T. C. MacMillan Clerk

13. U. S. CIRCUIT COURT,
N. D. of Ill.

Computing Scale Co., } In Equity,
vs. } No. 30,024.
Toledo Computing Scale Co. }

COMPLAINANT'S EXHIBIT ASSIGNMENT A.

ANNIE C. COURTENAY,
Notary Public.

(Seal)
Chicago, March 29, 1911.

2—391.

DEPARTMENT OF THE INTERIOR,
United States Patent Office.

To all persons to whom these presents shall come, Greeting:

This Is To Certify that the annexed is a true copy from the records of this office of an instrument of writing executed by Albert U. Smith and Edmond C. Smith January 12, 1897, and Recorded January 15, 1897, in Liber A-55, page 82. Said record has been carefully compared with the original and is a correct transcript of the whole thereof.

In Testimony Whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the City of Washington, this 2nd. day of February, in the year of our Lord one thousand nine hundred and eleven and of the Independence of the United States of America the one hundred and thirty-fifth.

F A TENNANT
Assistant Commissioner of Patents.

(Seal)
Liber A. 55.
Page 82.

Assignment of Patent.

Whereas, Reissued Letters Patent of the United States, number 11,536 dated April 28th 1896, were granted unto [1]Albert U. Smith and [2]Edmond C. Smith of [1]Seymour [2]Westport [1]New Haven [2]Fairfield County Connecticut, for improvements in Automatic Computing Scales.

And Whereas, the undersigned, the said Albert U. and Edmond C. Smith *(*of County*) are now *(*the sole*) owners of the following described interest in said Letters Patent, to wit; the entire right, title and interest therein.

And Whereas, The E. C. Smith Company, a corporation of Connecticut, located at Saugatuck, Fairfield County, said State is desirous of acquiring an interest in said Letters Patent.

Now, Therefore, in consideration of Two Dollars to us in hand paid, the receipt of which is hereby acknowledged, and other valuable considerations, *(*I*) we, the undersigned, do hereby sell and assign unto the said The E. C. Smith Company its legal representatives and successors *(*his heirs and assigns*), the following described interest in said Letters Patent, and in all re-issues and extensions thereof, to wit: the entire right, title and interest therein, and *(*I*) we do covenant and agree with the said The E. C. Smith Company that *(*I*) we *(*am*) are the exclusive owners of the entire right, title and interest herein assigned, and that *(*I*) we have good right to assign the same.

Witness *(*my*) our hands and seals this 12th day of January 1897

ALBERT U. SMITH (Seal)
EDMOND C. SMITH (Seal)

In presence of
O I ALLEN
HARRY B SMITH
Recorded Jan 15th 1897

(Endorsed) 18,945/11 U. S. Patent Office, Copy Made Feb 2 1911 M. M. A. A. S. M.

(Endorsed) Filed Jun 13 1912 At ..... O'clock .....M. T. C. MacMillan Clerk

*Matter in italics in parentheses, stricken out in original transcript.

U. S. CIRCUIT COURT,

N. D. of Ill.

Computing Scale Co.
vs.
Toledo Computing Scale Co. } In Equity, No. 30024.

COMPLAINANT'S EXHIBIT COPY OF ORIGINAL ASSIGNMENT "B."

ANNIE C. COURTENAY,
Notary Public.

(Seal)

Chicago, September 11, 1911.

Assignment.

Boston, Mass., April 7th, 1898.

Whereas, The E. C. Smith Co., a corporation duly created and existing under and by virtue of the laws of the state of Connecticut, having its factory in the town of Saugatuck, in said state, and its principal place of business in the city of Boston, in the state of Massachusetts, is now the sole owner of all the rights, titles and interests in and to a number of inventions for Spring Scales and other weighing scales, and in and to each and every of the letters patent issued or to be issued upon said inventions.

And, whereas, The Boston Computing Scale Co., a corporation duly created and existing under and by virtue of the laws of the state of Massachusetts, with its principal place of business in the city of Boston, in said state, is desirous of acquiring the entire rights, titles, and interest in and to said inventions and in and to the letters patent issued or to be issued therefor;

Now, therefore, be it known that for and in consideration of the sum of One Dollar, and other good and valuable consideration, to it moving, the receipt of which is hereby acknowledged, the said The E. C. Smith Co. has sold, assigned and transferred, and by these presents do sell, assign and transfer unto the said The Boston Computing Scale Co. the entire rights, titles and interests in and to all the inventions embodied in the scales manufactured or sold by said The E. C. Smith Co., and in and to all the letters patent issued or to be

issued therefor, and in and to any and all divisions, re-issues and extensions thereof; among the letters patents included in said transfer are the following: No. 445,616, September 3rd, 1895, to Albert U. Smith, for Automatic "Computing" Scale; Re-issue No. 11,536, April 28th, 1896, to Albert U. Smith, for Automatic "Computing" Scale; No. 586,876, July 20th, 1897 to Edmond C. Smith and Albert U. Smith, for Automatic "Computing" Scale, and No. 597,300, to Albert U. Smith, assignor to The E. C. Smith Co., January 11th 1898, for Price Scale.

The sole and exclusive right, title and interest in and to said letters patent and any and all inventions embodied in the scales made or sold by the said The E. C. Smith Co. and the letters patent to be issued therefor, to be used and enjoyed by the said The Boston Computing Scale Co. and its legal representatives for the full term for which said letters patent are or may be granted as fully and entirely as the same would have been used and enjoyed by the said The E. C. Smith Co. had this assignment and sale not been made.

THE E. C. SMITH COMPANY
CHAS. R LUCE *Pres't*
WILLIAM G BELL *Treas.*

State of Massachusetts } ss.
County of Suffolk }

March 8th 1899 Personally appeared before me, the persons known to be Charles R. Luce and William G. Bell, who executed the above instrument in my presence and acknowledged the signing of the same to be their voluntary act and deed.

C. F. BROWN
Stamp. *Notary Public.*

(Endorsed) 36661 2 S/13 92 U. S. Patent Office, Mar. 13, 1899. Recorded. Received and Recorded, March 13th, 1899. Liber W. 58, Page 351, C. D. Duell, Commissioner of Patents. Filed June 13, 1912, T. C. MacMillan, Clerk.

U. S. CIRCUIT COURT,

N. D. of Ill.

Computing Scale Co., *vs.* Toledo Computing Scale Co. } In Equity, No. 30,024.

COMPLAINANT'S EXHIBIT ASSIGNMENT B.

ANNIE C. COURTENAY,
Notary Public.

(Seal)

Chicago, March 29, 1911.

2—391.

DEPARTMENT OF THE INTERIOR,

United States Patent Office.

To all persons to whom these presents shall come, Greeting:

This Is To Certify that the annexed is a true copy from the records of this office of an instrument of writing Recorded March 13, 1899, in Liber W-58, page 351. Said record has been carefully compared with the original and is a correct transcript of the whole thereof.

In Testimony Whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the City of Washington, this 2nd day of February, in the year of our Lord one thousand nine hundred and eleven and of the Independence of the United States of America the one hundred and thirty-fifth.

F A TENNANT
Assistant Commissioner of Patents.

(Seal)

Liber W-58,
Page 351.

Assignment.

Boston, Mass, April 7th, 1898.

Whereas, The E. C. Smith Co., a corporation duly created and existing under and by virtue of the laws of the state of Connecticut, having its factory in the town of Saugatuck, in said state, and its principal place of business in the city of Boston, in the state of Massachusetts, is now the sole owner of all the rights, titles and interests in and to a number of inventions for Spring Scales and other weighing scales, and in and to each and every of the letters patent issued or to be issued upon said inventions.

And, whereas, The Boston Computing Scale Co., a corporation duly created and existing under and by virtue of the laws of the state of Massachusetts, with its principal place of business in the city of Boston, in said state, is desirous of acquiring the entire rights, titles and interest in and to said inventions and in and to the letters patent issued or to be issued therefor;

Now, therefore, be it known that for and in consideration of the sum of One Dollar, and other good and valuable consideration, to it moving, the receipt of which is hereby acknowledged, the said The E. C. Smith Co. has sold, assigned and transferred, and by these presents do sell, assign and transfer unto the said The Boston Computing Scale Co. the entire rights, titles and interests in and to all the inventions embodied in the scales manufactured or sold by said The E. C. Smith Co., and in and to all the letters patent issued or to be issued therefor, and in and to any and all divisions, re-issues and extensions thereof; among the letters patent included in said transfer are the following: No. 445,616, September 3rd, 1895, to Albert U. Smith, for Automatic "Computing" Scale; Re-issue No. 11,536, April 28th, 1896, to Albert U. Smith, for Automatic "Computing" Scale; No. 586,876, July 20th, 1897 to Edmond C. Smith and Albert U. Smith, for Automatic "Computing" Scale, and No. 597,300, to Albert U. Smith, assignor to The E. C. Smith Co., January 11th, 1898, for Price Scale.

The sole and exclusive right, title and interest in and to said letters patent and any and all inventions embodied in the scales made or sold by the said The E. C. Smith Co. and the letters patent to be issued therefor, to be used and enjoyed

by the said The Boston Computing Scale Co. and its legal representatives for the full term for which said letters patent are or may be granted as fully and entirely as the same would have been used and enjoyed by the said The E. C. Smith Co. had this assignment and sale not been made.

THE E. C. SMITH COMPANY
CHAS. R LUCE *Pres't*
WILLIAM G BELL *Treas.*

State of Massachusetts } ss.
County of Suffolk }

March 8th 1899 Personally appeared before me, the persons known to be Charles R. Luce and William G. Bell, who executed the above instrument in my presence and acknowledged the signing of the same to be their voluntary act and deed.

C. F. BROWN
Notary Public.

(Seal)

(C. F. Brown Notary Public, Suffolk County)

10 Ten Cents 10
I. R. Stamp
C. F. B.
Mar. 8—1899

Recorded Mar 13—1899.

(Endorsed) 18,945/11 U. S. Patent Office Copy Made Feb 2 1911 M. M. A. A. S. M.

(Endorsed) Filed Jun 13 1912 At ..... O'clock .....M. T. C. MacMillan Clerk

COMPLAINANT'S EXHIBIT ASSIGNMENT C.

Filed 19

U. S. CIRCUIT COURT,

N. D. of Ill.

Computing Scale Co.,
vs.
Toledo Computing Scale Co. } In Equity, No. 30024.

Complainant's Exhibit Assignment C.

ANNIE C. COURTENAY,
Notary Public.

(Seal)

Chicago, March 29, 1911.

Assignment.

Whereas, The Boston Computing Scale Co., a corporation duly created and existing under and by virtue of the laws of the State of Massachusetts, and having its principal place of business in the City of Boston, in said state, is now the sole owner of all the rights, titles, and interests in and to a number of inventions for Spring Scales and other weighing scales, and in and to each and every of the letters patent issued or to be issued upon said inventions;

And whereas, The Computing Scale Co., a corporation duly created and existing under and by virtue of the laws of the state of Ohio, with its principal place of business in the city of Dayton, in said State is desirous of acquiring the entire rights, titles and interests in and to said inventions, and in and to the letters patent issued or to be issued therefor:

Now, therefore, be it known that for and in consideration of the sum of one dollar and other good and valuable consideration, to it moving, the receipt of which is hereby acknowledged, the said The Boston Computing Scale Co., has sold, assigned and transferred and by these presents do sell, assign and transfer unto the said The Computing Scale Co., the entire rights, titles and interests in and to all the inventions embodied in the scales manufactured or sold by the said The Boston Computing Scale Co. and in and to all the letters patent issued or to be issued therefor, and in and to any and all divisions, re-issues and extensions thereof; among the letters patent included in said transfer are the following: No. 445,616, September 3rd, 1895, to Albert U. Smith, for Automatic "Computing" Scale; re-issue No. 11,536, April 28th, 1896 to Albert U. Smith, for Automatic "Computing" Scale; No. 586,876, July 20th 1897, to Edmond C. Smith and Albert U.

Smith, for Automatic "Computing" Scale; and No. 597,300, to Albert U. Smith, assignor to The E. C. Smith Co., January 11th, 1898, for Price Scale.

The sole and exclusive right, title and interest in and to said letters patent and any and all inventions embodied in the scales made or sold by the said The Boston Computing Scale Co., and the letters patent to be issued therefor, to be used and enjoyed by the said The Computing Scale Co., and its legal representatives for the full term for which said letters patent are or may be granted as fully and entirely as the same would have been used and enjoyed by the said The Boston Computing Scale Co., had this assignment and sale not been made.

THE BOSTON COMPUTING SCALE CO.
(Sgd) CHAS. R. LUCE, *Prest.* (Seal)
WILLIAM G. BELL, *Treas.*

State of Massachusetts } ss.
County of Suffolk. }

March 8, 1899, personally appeared before the persons known to me to be Charles R. Luce and William G. Bell, executed the above instrument in my presence and acknowledged the signing of the same to be their voluntary act and deed.

C. F. BROWN,
N'y Pub. (Notary Seal)

(Endorsed Filed June 13, 1912, T. C. MacMillan, Clerk.

ıe 13.

UNITED STATES DISTRICT COURT

Northern District of Illinois

Eastern Division.

The Computing Scale Company,
—*vs*—
Toledo Computing Scale Company, } In Equity No. 30,024.

COMPLAINANT'S EXHIBIT SMITH MEMORANDUM STATEMENTS AGAINST BOSTON COMPUTING SCALE COMPANY, DATED NOVEMBER SEVENTEENTH, EIGHTEENTH AND TWENTY-FOURTH, 1897.

(3 sheets)

(Seal)

ALBERT GARCEAU
Notary Public & Special Examiner.

(Cut) Saugatuck, Conn., Nov. 17 1897.

M Boston Computing Scale Co.

To The E. C. Smith Co., Dr.

Incorporated.

Manufacturers of Computing Scales,

#240

241 To 25 D F. Scales 20.— 500.00

242

243

244

245 Order #117 Complete.

246

247

248

249 Billed to Order of The Boston

250

251 Computing Scale Co.

252

253 Chicago, Ill.

254

255

256

257 Nickel Plate Line.

258

259 Paid Dec. 20/97 (29)

260 The E. C. Smith Co.

261 Pr E. C. Smith.

262

263

264

(Cut) Saugatuck, Conn., Nov. 18, 1897.

M Boston Computing Scale Co.

To The E. C. Smith Co., Dr.

Incorporated.

Manufacturers of Computing Scales,

To 10 D. F. Scales #266 to 275 inclusive	20.00	200.00
To 5 Ounce Scales #1005 to 1009 inclusive.	20.—	100.00

Star Union Line to
C. E. Goldsmith
71 N. Illinois St.
Indianapolis, Ind.
On a/c of Order #118.

Paid Dec. 20/97
The E. C. Smith Co.
pr E. C. Smith

(Cut) Saugatuck, Conn., Nov. 24, 1897.

M Boston Com. Scale Co.
To The E. C. Smith Co., Dr.
Incorporated.
Manufacturers of Computing Scales,

#278			
279	To 25 D. F. Scales	20.00	500.00
280			
281			
282			
283	Order #122 Complete		
284			
285	By Nickel Plate Line, billed		
286			
287	to order of The Boston Computing		
288			
289	Scale Co. Chicago, Ill.		
290			
291	Paid Dec. 28/97		
292	The E. C. Smith Co.		
293	pr E. C. Smith		
294			
295			
296	(30)		
297			
298			
299			
300			
301			
302			

(Pencil notation on above) B D C.

(Endorsed) Filed Jun 13 1912 At ..... O'clock ..... M.
T. C. MacMillan Clerk

UNITED STATES DISTRICT COURT

Northern District of Illinois

Eastern Division

The Computing Scale Company
vs.
Toledo Computing Scale Company
} In Equity No. 30024.

COMPLAINANT'S EXHIBIT SMITH STATEMENTS AGAINST BOSTON COMPUTING SCALE COMPANY DATED DEC. 15, 1897 & JAN. 1, 1898.

(2 sheets)

(Seal)

ALBERT GARCEAU
Notary Public & Sp'l. Ex'r.

Monthly Statement.

Saugatuck, Conn., Dec. 15 1897.

M B C S Co.

To E. C. Smith, Dr.

Terms Net Cash.

From Dec. 1 to 15 Inclusive

Dec	1	13	D. F. Scales Chicago		104.00		104.00
"	2	12	" " " "		96.00		96.00
"	"		Ex on name plate 200.45		45		
"	3	5	D. F. Scales		40.00		
"	"	5	oz. "		37.50		
"	4	12	D. F. "		96.00		
"	"		Ex on name plates		65		
"	6	5	D. F. Scales		40.00		
"	"		Ex on name plates		35		
"	"		Frt on 8 Scales from Chicago		1.56		
"	7	10	#2 Scales	291.06	75.00		

(Notation in ink on above) Pd Jan 10th 189S

"	10	10	" "		75.00		
			and 1 oz. Scale	7.50	37.50)	Scranton	
"	"	4	#2 Scales	30.00	)		
"	11	9	#2 Scales to N. Y. C. S. C.		67.50		
"	"		Ex on name plates	18065	65		

(Notation in ink on above) Pd Feb 26 1898

"	13	5	#2 Scales		37.50		
"	"		Ex on Scale from B'port		20		
"	15	10	D. F. Scales		80.00		
"	"		Frt & Ex on name plates		80		
"	"	3	oz. Scales	22.50	)		
			and 2 #2 Scales	15.00	37.50)	Phila.	
					828.16		

(Pencil notation on above) Paid Jany 31

Monthly Statement.

Saugatuck, Conn., Jany 1, 1898.

M Boston Computing Scale Co.
To E. C. Smith, Dr.
The E. C. Smith Co.

Terms Net Cash.
Statement Rendered from Dec 1 to 15 Inclusive

Dec. 17	5	#Imp Scales			27.50		
" "	7	oz Scales			52.50		393.02
" "	1	" "		to Webber	7.50		120.60
" 18	5	" "			37.50		
							272.42

(Pencil notation on above) Pd Jany 31 1898

" 22	10	#2 Imp			75.00	
" "	Repeating name plate				1.92	
" 23	4	#2 Imp Scale		30.00	)	
		and 1 oz. Scale		7.50	37.50)	Scranton
" 24	8	#2 Imp Scales			60.00	
" "	5	oz. Nickel "			37.50	
" 27	2	#2 Imp Scales			15.00	
" "	6	oz. " "			45.00	

(Pencil notation on above) Paid Feb 3rd 1898

" "	15	D. F. "		120.00	)		
		and glass	39302	.60x	120.60)	Chicago	
" 28	Ex on name plates			x	1.10		281.00
" "	18	D. F. Scales		144.00	)		
		and recovering &c.		15.30 x	159.30)	Milwaukee	

(Pencil notation on above) Paid Feb 7th

" 30	13	D. F. Scales	104.00
" "	Ex on name plates		65
" 31	10	#2 Imp scales	75.00
			179.65

(Pencil notation on above) Paid Feb 12 179.65

(Endorsed). Filed Jun 13 1912 At .....O'clock .....M.
T. C. MacMillan Clerk

UNITED STATES DISTRICT COURT

Northern District of Illinois,

Eastern Division.

The Computing Scale Company,
—*vs*—
Toledo Computing Scale Company,
} In Equity No. 30,024.

COMPLAINANT'S EXHIBIT BILL OF WILLIAM G. BELL COMPANY, DATED MARCH FIFTEENTH, 1897.

(Seal) ALBERT GARCEAU
Notary Public & Special Examiner.

The William G. Bell Company

(Cut) Successors to Wm. G. Bell & Co. (Cut)

Sole Manufacturers of Bell's Siced Seasoning

Manufacturers & Dealers in Marketmens & Grocers Store Fixtures.

Office & Salesrooms,
48, 50, 52 & 54 Commercial St.
Terms: Net Cash.

Boston, March 15 1897

Sold to Boston Computing Scale Co.

To 33 Acme Scales @ 7.50	247.50	
" Freight on same	2.46	
" Teaming "	1.65	251.61
" Teaming & freight on 20 Acme Scales		2.38
Inv 1		253.99

If terms are not correct, or goods as represented, or prices charged are not as bought, notify at once or settle by this invonce.

(Endorsed) Filed Jun 13 1912 At ..... O'clock .....M.
T. C. MacMillan Clerk

UNITED STATES DISTRICT COURT

Northern District of Illinois

Eastern Division.

The Computing Scale Company,
—*vs*—
Toledo Computing Scale Company,
} In Equity No. 30,024.

COMPLAINANT'S EXHIBIT RECEIPT ISSUED BY E. C. SMITH COMPANY, DATED APRIL TWENTY-FIRST, 1897.

ALBERT GARCEAU
(Seal) *Notary Public & Special Examiner.*

Saugatuck April 21, 1897.

Received from Boston Computing Scale Co. Three hundred seventy five 00/100 Dollars for bills dated March 16/17/18/20/20, 1897

THE E. C. SMITH CO.
pr E C SMITH, *Treas.*

$375.

(Endorsed) Filed Jun 13 1912 At ..... O'clock .....M.
T. C. MacMillan Clerk

DEFENDANT'S EXHIBITS.

U. S. DIST. CT.

N. Dist. Ill.

Eastern Div.

The Computing Scale Co

vs

Toledo Computing Scale Co

In Equity No. 30024

DEFTS. EX. FILE WRAPPER ORIGINAL PATENT 545,616

KATE S. HOLMES
Notary Public & Examiner

2—390.

UNITED STATES OF AMERICA,

DEPARTMENT OF THE INTERIOR,

United States Patent Office.

To all to whom these presents shall come, Greeting:

This Is To Certify that the annexed is a true copy from the Records of this Office of the File Wrapper, Contents, and Drawings, in the matter of the Letters Patent of Albert U. Smith, Assignor of one-half to Edmond C. Smith, Number 545,616, Granted September 3, 1895, for Improvement in Automatic Computing-Scales.

In Testimony Whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the City of Washington, this 10th. day of November, in the year of our Lord one thousand nine hundred and eleven and of the Independence of the United States of America the one hundred and thirty-sixth.

F A TENNANT

(Seal) *Assistant Commissioner of Patents.*

(Serial Number,) 547929 1895. (Ex'r's Books,) Div 117

476

Patent No. 545,616
Albert U. Smith
Assor of 1/2 to Edmond C. Smith
of Westport,
Conn.

Of Seymour
County of
State of Connecticut
Invention Automatic Computing Scale

Parts of application filed

Petition	May 2, 1895.
Affidavit	" " "
Specification	" " "
Drawing 4 shts,	" " "
Model	
Specimen	
First Fee Cash $15.	May 2, 95
" " Cert.	
1	

(Printed in red ink across above) Reissue Aprl 28/96 No. 11,536
App. filed Complete May 2-95
Examined Aug. 8. 95 J. T. Newton Ex
2
Countersigned: J W Babson
8-9-9 5. For Commissioner.
Notice of Allowance August 10, 1895
Final Fee Cash $20. Aug. 13, 1895
" " Cert. , 189
3

Patented September 3, 1895
F. W. Smith Jr.
Bridgeport,
Conn.

Bridgeport, Conn., May 1, 1895.

Hon. Comm. of Patents—

Herewith please find application of Albert U. Smith for patent for Improvement in Automatic Computing Scales. Also my check to file same—

Respy
F. W. SMITH JR.

(Endorsed) U. S. Patent Office May 2 1895 Chief Clerk

PETITION.

To the Commissioner of Patents:

Your petitioner Albert U. Smith a citizen of the United States, residing at Seymour in the County of New Haven, State of Connecticut prays that Letters Patent may be granted to him for improvement in Automatic Computing Scales as set forth in the annexed specification.

And I hereby appoint F. W. Smith, Jr., of Bridgeport, Conn., my Attorney, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to sign the drawings, to receive the Patent, and to transact all business in the Patent Office connected therewith.

Signed at Bridgeport, in the County of Fairfield, and State of Connecticut, this 27th day of April 1895

ALBERT U SMITH

SPECIFICATION.

To all whom it may concern:

Be it Known, That I, Albert U. Smith a citizen of the United States, residing at Seymour in the County of New Haven and State of Connecticut have invented certain new and useful improvements in Automatic Computing Scales and I do hereby declare the following to be a full, clear and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain new and useful improvements in Weighing Scales whereon the weight and selling price of a commodity may be ascertained at a glance without any mental calculation on the part of the person using the same, but particularly resides in the details of construction

and combination of elements as will be fully hereinafter described and specifically pointed out in the claims.

The object of my invention is to provide scales of this description which shall be extraordinarily sensitive to weights of small amount and to accurately register the same. A further object of my invention is to provide an adjusting mechanism by the use of which the springs employed may at all times be held at any uniform tension, or, in other words, when said springs have become weakened or distorted by long usage the adjusting mechanism may be employed to restore a proper tension to said springs. Also said adjusting mechanism may be used to set the scales at a "balance" after the weighing pan is suspended therefrom, and the difference in weight of various kinds of weighing pans may be compensated for by the use of this mechanism.

In the accompanying drawings

Figure 1 is a front elevation showing a weighing pan suspended from the scales.

Figure 2 a section at the line x, x, of Figure 3—

Figure 3 a section on the line y, y, of Figure 2—

Figure 4 a section on the line z, z, of Figure 2, and

Figure 5 a detail elevation of the indicator drum.

Similar numbers of reference indicates like parts in the several figures of the drawings.

a is the casing on opposite sides of which are rigidly secured uprights *b*. *c* is a cross-bar loosely journaled in the upright *b* above the top of the casing but held as against lengthwise movement by pins *d* which pass through said bar. The ends of the cross-bar *c* are notched as shown at *e* in Figure 3, and the headed draft pins *f* are loosely held within these notches by keeper pins *g*. The said draft-pins have secured loosely in their lower ends bow-shaped clips *h* the ends of which are inserted between the coils of the springs *j*. *k* are draft-rods the upper ends of which are connected to the lower coils of the springs *j* by means of slips *l* similar to the clips *h* which are pivotally connected to the rods *k* by simply inserting said clips through perforations *m* in said rods. Each of the rods *k* have a series of these perforations *m* so that a greater or lesser length of spring may be used as the exigencies of the case require.

The lower ends of the draft-rods are pivotally connected by a yoke *n*.

p are hollow bosses formed integral with the uprights *b* within the outer extremities of which are adjustable bearings

r for the shaft s. The ends of the shaft s are formed into cone-journals t and the bearings r for this shaft are correspondingly shaped. u are set screws for holding said bearings in place after a proper adjustment has been made.

v is an indicator drum which is rigidly secured to the shaft s. It is a very essential feature that the indicator drum in scales of this nature should be made of very light material for the reason that if it be not so made the sensitiveness and accuracy of the scales will be more or less affected. For instance heretofore in scales of this character if a given quantity is weighed successively a number of times it will be found that said scales scarcely ever indicate the weight of such quantity twice exactly the same, there always being some slight variation in the amount registered. This is in a great measure due to the fact that the more the actual weight of the indicator drum itself, the greater must be the force necessary to operate it, and in order to overcome this disadvantage I have constructed the drum of thin skeleton frames w of aluminum, while the periphery is formed of a thin sheet of paper pasted to the frames. In this way I have secured a structure that is so light that the force necessary to operate it is almost insignificant.

a^1 is a cross-rod to which is secured a screw b^1. The screw b^1 passes loosely through the yoke n, as shown at Figure 4, and has within its lower end a ring c^1 from which the scale pan d^1 is suspended. Pivoted to the cross bar a^1 are rack bars e^1 which engage pinions f^1 rigid with the shaft s. The hollow bosses p are at one side slotted or cut away, as shown at g^1 in Figure 3, so that the rack bars may be permitted to engage the pinions f^1. h^1 are keepers (but one shown) which insure the engagement of the rack bars and pinions.

The ends of the cross rod a^1 are notched as shown at j^1, and said ends embrace the edges of the draft rods k in such manner as to be capable of sliding thereon.

k^1 is a slot in the yoke n and within this slot is an adjusting nut l^1 which takes on the thread of the screw b^1. m^1 is a set screw on the lower portion of said screw.

By revolving the nut l^1 the cross rod a^1 to which the screw b^1 is connected will be caused to move up or down, as the case may be, carrying with it the rack bars e^1 which will, through the pinions f^1, effect the rotation of the indicator drum, as may be desired.

Thus should the scales when at rest indicate anything other than a perfect "balance" or zero, by turning the nuts l^1, m^1,

the drum may be brought into proper relative position and there secured without disturbing the tension of the springs *j*.

Should it be found necessary to increase or diminish the tension of the springs *j* this may be easily effected by advancing the clips *h* along the coils of said springs after the manner of advancing a nut along a screw thread.

The lower portions of the uprights *b* are formed into guide ways b^2 through which the ends of the cross rod a^1 and said draft rods *k* pass so that said rods will be properly guided in their movements.

The cross bar *c* is provided with a ring clip p^1 by means of which the scales may be suspended from any suitable support.

Around the periphery of the drum *v*, at the central portion of the same, is a scale r^1 (see Figures 1 and 5) indicating pounds and ounces. s^1 are columns of figures parallel with the scale r^1 and arranged in alignment therewith, which indicate the total amount in money for which a commodity should be sold after it has been weighed. t^1 is an opening in the face of the casing *a* within which is fitted a glass u^1 through which may be seen the figures on the periphery of the drum. The glass u^1 has printed or suitably inscribed thereon a series of figures v^1 which register with the columns of figures s^1 and indicate various prices per pound.

The central portion of the glass has marked thereon the abbreviations P. and Oz. and the scale r^1 on the periphery of the drum is adapted to register with these characters.

Supposing that some article which weighs exactly three pounds has been placed in the weighing pan of the scales; the indicator drum will be brought to a position where the figure 3 in the column of pounds on the scale of the drum will be disclosed to view, as shown in Figure 1.

Supposing also that the price of such article is eight cents per pound; the operator will consult the series of figures on the glass until the number 8 is reached, when immediately above it will appear the total value of the article, i. e. 24.

In Figure 5, I have shown a detail view of the faces of the drum whereon the figures are inscribed and the broad straight line w^1 shown in this figure is intended to show through the glass w^1 when the scales are at rest and at a "balance" or zero.

I am aware that computing scales have heretofore been constructed wherein a drum or cylinder is employed having the divisions of the weight scale and other figures on its

periphery whereby the total selling price of an article may be determined without mental calculation on the part of the operator, and I am also aware that said drum has been operated by a rack bar and pinion, and I therefore do not broadly make any claim to these features, but what I do claim and desire to secure by Letters Patent is:—

1—The combination of the casing *a* the uprights *b* rigid with the sides thereof, the cross bar *c*, the draft rods *k* connected at their lower ends by a yoke *n*, the springs interposed between said draft rods and cross bar in the manner specified, of the indicator drum journaled within the uprights and carrying pinions which are engaged by rack bars, the cross rod a^1 to which the lower ends of the rack bars are connected, the screw b^1 depending from the cross rod and passing through the yoke *n* and the set nuts on said screw, substantially as and for the purpose set forth.

2—The combination of the indicator drum constructed of thin skeleton frames of a very light material, the periphery of said drum being formed of a sheet of paper having the divisions of the weight scale and other numerals printed thereon, the pinions carried by the shaft or said drum, adjustable conical †cross bearings wherein said shaft is journaled, the *(rack) bar *c* having a suspending clip secured thereon, the headed draft pins supported loosely within the notched ends of the cross bar *c* after the manner of a stirrup connection, the bow shaped clips in the ends of the draft pins, the springs between the coils of which said clips are inserted, whereby the tension on said springs may be altered as described, the draft rods *k*, the yoke *n* whereby said rods are connected, the cross rod a^1 to which the rack bars are pivoted and whose ends are notched and embrace said draft rods so as to be capable of sliding thereon, a ring from which the scale pan is suspended, and suitable adjusting connection between the yoke *n* and said cross rod a^1, substantially as described.

July 12/95

*(3—*In a scales of the character set forth, the combination of suitable instrumentalities for communicating the motion of the draft rods to the indicator drum, of means—as a screw and set nuts—for rotat-*

Sub A

*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

June 27/95 *ing said drum independent of such instrumentalities whereby the difference between the weights of various scale pans may be compensated for, substantially as set forth.)*

In testimony whereof I affix my signature in presence of two witnesses.

ALBERT U SMITH

Witnesses:
F. W. SMITH JR.
M. L. LONGDEN.

OATH.

County of Fairfield } ss.
State of Connecticut }

I, Albert U. Smith the above-named petitioner, a citizen of the United States and resident of Seymour, in the County of New Haven and State of Connecticut, being duly sworn, depose and say that I verily believe myself to be the original, first and sole inventor of the improvement in Automatic Computing Scales described in the foregoing specification; that the same has not been patented to me nor to others, with my knowledge or consent, in any country, that the same has not to my knowledge been in public use or on sale in the United States for more than two years prior to this application; and I do not know and do not believe that the same was ever known or used prior to my invention thereof.

ALBERT U SMITH

Sworn to and subscribed before me, this 27th day of April 1895

F. W. SMITH JR.
Notary Public

(Notarial Seal)

(Endorsed) Serial No. 547929 Paper No. 1/2 Application Filed May 2" 1895. A. U. Smith U. S. Patent Office. May 2 1895 Chief Clerk.

*Matter in italics in parentheses, stricken out in original transcript.

2—260

Div. ..... Room 256 Paper No. .....

Address only "The Commissioner of Patents, Washington, D. C."

All communications respecting this application should give the serial number, date of filing, and title of invention.

J. P. H.

DEPARTMENT OF THE INTERIOR

United States Patent Office.

Washington, D. C., June 4, 1895

Mailed " " "

Albert U. Smith,
Care F. W. Smith, Jr.,
Bridgeport, Conn.

Please find below a communication from the Examiner in charge of your application for Automatic Computing Scale, filed May 2, 1895, serial number 547,929

JOHN S. SEYMOUR
Commissioner of Patents.

Claim 3 is rejected on reference to the patent to Barker, No. 67,482, Aug. 6, 1867 or Gerard, No. 459,108, Sept. 8, 1891, Spring Scales, either showing suitable instrumentalities whereby the difference between the weights of various scale pans may be compensated for.

J. T. NEWTON
Ex

W. B. H.

(Endorsed) Serial 547929 Paper No. 1 Rej Dated June 4 1895.

Room 256—
Albert U. Smith—
No. 547,927.

Automatic Computing Scale
Filed May 2, 1895.

Hon. Commissioner of Patents:—

I hereby amend this application as follows:

Strike out claim 3 and substitute therefor the following—

A "3——The combination of the casing *a*, the uprights *b* rigid with the sides thereof, the cross bar *c*, the draft rods *k* connected at their lower ends by a yoke *n*, the springs interposed between said draft rods and cross bar, the indicator drum journaled within the uprights and carrying pinions, the rack bars engaging with said pinions, the cross rod a^1 to which the lower ends of the rack bars are connected, and the pin b^1 pivoted to said cross rod and rigidly connected with the yoke *n* as to vertical movement and provided with means whereby a scale pan may be attached, substantially as set forth.

Erase & Insert B Aug. 2/95 *(*4—*The combination of the cross rod a^1, the springs connected at their upper extremities to a stationary part of the scale, the draft rods suspended from the lower extremities of said springs, the yoke connecting the lower ends of said draft rods, and the pin b^1 pivoted to the cross rod a^1 and depending therefrom and provided at its lower extremity with means for attaching a scale pan, said pin being rigidly connected with the yoke n as to vertical movement, substantially as set forth.*")

Very respectfully submitted,
F. W. Smith Jr
Attorney for Applicant.

Bridgeport, Conn. June 26, 1895

(Endorsed) Serial No. 547929 Paper No. 2. "A" Amdt Filed June 28 1895 A. U. Smith. United States Jan 27 1895 Patent Office. Div. 23, June 28 1895 U. S. Patent Office

*Matter in italics in parentheses, stricken out in original transcript.

2—260

Div. ..... Room 257 Paper No. .....

Address only "The Commissioner of Patents, Washington, D. C."

All communications respecting this application should give the serial number, date of filing, and title of invention.

J. P. H.

DEPARTMENT OF THE INTERIOR

United States Patent Office

Washington, D. C., July 9, 1895

Mailed " 10, "

Subject. Automatic Computing Scale.

Filed May 2, 1895 No. 547,929

Albert U. Smith
Care F. W. Smith, Jr.,
Bridgeport, Conn.

Please find below a communication from the Examiner in charge of the application above noted.

JOHN S. SEYMOUR
Commissioner of Patents.

In line 6, the words "the rack bar *c*" should read "the cross bar *c*."

After this correction has been made an interference will be declared between this application and the patent to Swihart, No. 539,599, May 21, 1895, Measuring Instruments, Price Scales, which was a pending application at the time this was filed, but was patented before action was taken on this case.

J. T. NEWTON
Ex

W. B. H.

(Endorsed) Serial No. 547929 Paper No. 3 Letter Dated July 9, 1895.

Room 217—
Albert U. Smith, Automatic Computing Scale.
No. 547,929. Filed May 2, 1895.

Hon. Commissioner of Patents:—

The Official action of the 9th instant is at hand. I hereby amend this application by striking out the words "rack bar" in line 6 of claim 2, and substituting therefore the words "cross bar".

Remarks: I suppose that this is the amendment that the Office desires although the Official letter does not specify any particular page or claim to be corrected.

I would greatly prefer to get a definite and proper action on this case before entering upon any Interfernce proceedings. Now under the Rules of Practice the Examiner should either reject claims 3 and 4 which were put in by amendment dated June 26, 1895, or he should allow these claims, and his letter should specifically state such rejection or allowance.

The Attorney can form no conclusions but can merely guess at the actions on these claims.

I suppose of course that this was a mere oversight on the part of the Office, but as a safeguard to applicant it is submitted that the action before suggested should be rendered.

It is unfortunate that this patent issued to Swihart since the patentee is thereby given the benefit of his possession of a patent, whereas the applications were pending at the same time. The present application was filed on May 2, 1895, and Swihart's final fee must have been paid about that time, so that his application should have been withdrawn from issue instead of allowing it to become a patent. I always understood that a cursory examination was given applications on their filing to determine the nature of improvement in order to prevent the issue of patents on Interfering inventions, but if this is not the practice in the Patent Office then I can readily understand how this particular patent was issued.

However, I greatly desire that the Examiner would render the action above suggested, for otherwise applicant has no legal or equitable standing whatever as to his claims last put in by amendment.

Very respectfully submitted,

F. W. Smith Jr.
Attorney for Applicant.

Bridgeport, Conn., July 11, 1895.

(Endorsed) Serial No. 547929 Paper No. 4 Amendt. Filed July 12 1895. A. U. Smith United States Jul 12 1895 Patent Office. Div. 23, Jul 13 1895 U. S. Patent Office

2—260

Div. ..... Room .....

Paper No. .....

Address only "The Commissioner of Patents, Washington, D. C."

All communications respecting this application should give the serial number, date of filing, and title of invention.

J. P. H.

DEPARTMENT OF THE INTERIOR

United States Patent Office

Washington, D. C., July 30, 1895.

Mailed " 31, "

Albert U. Smith,
Care F. W. Smith, Jr.,
Bridgeport, Conn.

Please find below a communication from the Examiner in charge of your application for Automatic Computing Scale, filed May 2, 1895, serial number 547,929.

JOHN S. SEYMOUR,
Commissioner of Patents.

Claim 4 is rejected on the ground that it covers an incomplete combination of elements. The claim should contain the device for indicating the weight.

When this connection is made the case will be in condition for allowance.

The interference referred in in the last office letter will not be declared.

J. T. NEWTON
Ex.

W. B. H.

(Endorsed) Serial No 547929 Paper No. 5. Rej. Dated July 30, 1895

Room 217,
Albert U. Smith, Automatic Computing Scale,
Filed May 2, 1895.

Hon. Commissioner of Patents:—

I hereby amend this application as follows:

Strike out claim 4 and substtiute therefor the following claim—

B	"4—The combination of the cross rod a^1, the springs connected at their upper extremities to a stationary part of the scale, the draft rods suspended from the lower extremities of said springs, the yoke connecting the lower ends of said draft rods, the pin b^1 pivoted to the cross rod a^1 and depending therefrom and provided at its lower extremity with means for attaching a scale pan said pin being rigidly connected with the yoke n as to vertical movement, the rotary weight indicating device, and means carried by the cross rod a^1 for operating said device, substantially as set forth."

Very respectfully submitted,
F. W. Smith, Jr.,
Attorney for Applicant.

Bridgeport, Conn., August 1, 1895.

(Endorsed) Serial No. 547929 Paper No. 6 Amend't B Filed Aug. 2, 1895 A. U. Smith United States Aug 2 1895 Patent Office. U. S. Patent Office, Aug 2 1895 Division XVII. Div. 23, Aug 3 1895 U. S. Patent Office

Serial No. 547929

Issue Division.

All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

Department of the Interior,
United States Patent Office,
Washington, D. C., Aug. 10, 1895.

Albert U. Smith, Assor
c/o F. W. Smith, Jr.
Bridgeport,
Conn.

Sir:

Your Application for a patent for an Improvement in Automatic Computing Scales, filed May 2, 1895, has been examined and Allowed.

The final fee, Twenty Dollars, must be paid, and the Letters Patent bear date as of a day not later than Six Months from the time of this present notice of allowance.

If the final fee is not paid within that period that patent will be withheld, and your only relief will be by a renewal of the application, with additional fees, under the provisions of Section 4897, Revised Statutes. The office aims to deliver patents upon the day of their date, and on which their term begins to run; but to do this properly applicants will be expected to pay their final fees at least Twenty Days prior to the conclusion of the six months allowed them by law. The printing, photolithographing, and engrossing of the several patent parts, preparatory to final signing and sealing, will consume the intervening time, and such work will not be done until after payment of the necessary fees.

When you send the final fee you will also send, Distinctly and Plainly Written, the name of the Inventor and Title of Invention as Above Given, date of Allowance (which is the date of this circular), Date of Filing, and, if assigned, the Names of the Assignees.

If you desire to have the patent issue to Assignees, and assignment containing a Request to that effect, together with the Fee for recording the same, must be filed in this office on or before the date of payment of final fee.

Additional copies of Specifications and Drawings will be charged for at the following rates: Single Copies, uncertified, 10 cents each. The money should accompany the order.

Very respectfully,

JOHN S. SEYMOUR,
Commissioner of Patents.

After allowance, and prior to payment of the final fee, applicants should carefully scrutinize the description to see that their statements and language are correct, as mistakes not incurred through the fault of the office, and not affording legal grounds for reissues, will not be corrected after the delivery of the letters patent to the patentee or his agent.

(Stamped in left-hand margin.) The within title is that given by the Examiner in charge, as most appropriate to your invention. Should you desire a change in the same, satisfactory reasons Must be given therefor on or before the payment of the final fee.

(Printed in left-hand margin.) ☞In remitting the final fee give the serial number at the head of this Notice.

2—327.

Amount Received
$20— Ck
Chief Clerk.

Memorandum
of
Fee Paid at United States Patent Office.

(Be careful to give correct Serial No.)

....., 1895.

Serial No. 547929.
Inventor: Albert U. Smith.
Patent to be issued to ½ to E. C. Smith Assignee.
Name of Invention, as allowed: Computing Scale.
Date of Payment: Aug. 12, 1895.
Fee: $20.
Date of Filing: May 2, 1895.
Date of Circular of Allowance: Aug. 10, 1895.

The Commissioner of Patents will please apply the accompanying fee as indicated above.

F. W. SMITH, JR.,
Attorney.

Send Patent to
F. W. Smith, Jr.
Patents,
Bridgeport, Conn.

(Endorsed) U. S. Patent Office, Aug 13, 1895. Chief Clerk

(Here follows Letters Patent No. 545,616, a copy of the same heretofore set out in this record and not reproduced here.)

73 Measuring Instrument,
Price Scales. (2-191.)

1895.

Contents.

½. Application 1 paper.
1. Rej June 4, 1895.
2. Amdt "A" June 28/95.
3. Letter July 9, 1895.
4. July 12/95. Amendt.
5. Rej. July 30, 1895
6. Aug. 2/95 Amend't B.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.
18.
19.
20.
21.
22.
23.

Title:
Improvement in
Automatic Computing
Scales.

(Here follow four sheets of Drawings omitted by stipulation.)

(Endorsed) Filed June 13, 1912, T. C. MacMillan, Clerk.

U. S. Dist. Ct.

Northern Dist. Ill.

Eastern Div.

The Computing Scale Co.

vs.

Toledo Computing Scale Co.

In Equity No. 30024

DEFTS' EXHIBIT FILE WRAPPER REISSUE IN SUIT 11536

Kate S. Holmes
Notary Public & Examiner

2—390.

UNITED STATES OF AMERICA,

Department of the Interior,

United States Patent Office.

To all to whom these presents shall come, Greeting:

This It To Certify that the annexed is a true copy from the Records of this Office of the File Wrapper, Contents, and Drawings, in the matter of the Reissue Letters Patent of Albert U. Smith, Assignor of one-half to Edmond C. Smith, Number 11,536, Granted April 28, 1896, for Improvement in Automatic Computing-Scales.

In Testimony Whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the City of Washington, this 10th day of November, in the year of our Lord one thousand nine hundred and eleven and of the Independence of the United States of America the one hundred and thirty-sixth.

F A Tennant
Assistant Commissioner of Patents.

(Seal)

(Serial Number.)
577074

(Ex'r's Book.)
164

74

1896.

Reissue.

No. 11536

Albert U. Smith assor
of 1/2 to Edmond C. Smith,
of Westport, Conn.
Of Seymour

County of
State of Connecticut.
Invention Automatic Computing Scales.

Parts of Application filed.

Petition	Jan 27—,	1896
Affidavit	" "	"
Specification	" "	"
Drawing 4 shts.	" "	"
Old Patent	Jan 27—	96.
Abstract of Title	" "	"
Cert. dep.		
Cash 1 $30	Jan 27-	96.
2 App. filed Complete	" "	"

No. and date of original patent 545,616.
Sep 3.d 1895.

Examined Ap'l 4 '96. J. T. Newton Ex
Countersigned J W Babson
For Commissioner.

Notice of allowance April 6, 1896
Reissued April 28, 1896. A. M. Wooster
Bridgeport
Conn.

Arthur W. Harrison
City.

Amount Received
$30—ck
Chief Clerk.

Bridgeport, Conn. Jan. 25, 1896.

Hon. Com'r of Patents,
Washington, D. C.

Sir:—

Please find herewith petition, specification, oath, abstract of title and original patent No. 545,616, to A. U. Smith dated Sept. 3, 1895 together with $30., part of the inclosed check, in payment of Gov't fee for reissue of said patent.

Very respectfully,

A. M. WOOSTER.

(Endorsed) U. S. Patent Office, Jan 27 1896 Chief Clerk.

Amount Received
$
Chief Clerk.

PETITION FOR REISSUE.

To the Commissioner of Patents:

Your petitioner Albert U. Smith, a citiezn of the United States, residing at Seymour, in the County of New Haven, State of Connecticut, prays that he may be allowed to surrender the Letters Patent for improvements in Automatic Computing Scales granted to him September 3, 1895 whereof he is now owner of an undivided one half part and whereof Edmond C. Smith of Saugatuck, Township of Westport, Connecticut is now owner of an undivided one half part by assignment and with whose assent this application is made; and that Letters Patent may be reissued to him and to the said Edmond C. Smith for the same invention, upon the annexed amended specification. With this petition is filed an abstract of title, duly certified, the patent, and the statement required in such cases.

And he hereby appoints A M Wooster of Bridgeport, State of Connecticut, his attorney with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to sign the drawings, to receive the patent, and to transact all business in the Patent Office connected therewith.

Signed at Bridgeport, in the County of Fairfield, and State of Connecticut, this 25th day of January, 1896.

ALBERT U SMITH

The undersigned assignee of an undivided one half interest in the above mentioned Letters Patent hereby assents to the accompanying application

EDMOND C. SMITH.

SPECIFICATION.

Be it Known, That I, Albert U. Smith, a citizen of the United States, residing at Seymour, in the County of New Haven, and State of Connecticut, have invented certain new and useful improvements in Automatic Computing Scales and I do hereby declare the following to be a full, clear, and exact description thereof, such as will enable others skilled in the art to which it appertains, to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to certain new and useful improvements in weighing-scales whereon the weight and selling price of a commodity may be ascertained at a glance without any mental calculation on the part of the person using the same, but particularly resides in the details of construction and combination of elements, as will be fully hereinafter described, and specifically pointed out in the claims.

The object of my invention is to provide scales of this description which shall be extraordinarily sensitive to weights of small amount and to accurately register the same.

A further object of my invention is to provide an adjusting mechanism by the use of which the springs employed may at all times, be held at a uniform tension, or, in other words, when said springs have become weakened or distorted by long usage the adjusting mechanism may be employed to restore a proper tension to said springs; also said adjusting mechanism may be used to set the scales at a "balance" after the weighing-pan is suspended therefrom, and the difference in weight of various kinds of weighing-pans may be compensated for by the use of this mechanism.

In the accompanying drawings, Figure 1 is a front elevation showing a weighing-pan suspended from the scales; Fig.

2, a section at the line *x x* of Fig. 3; Fig. 3, a section on the line *y y* of Fig. 2; Fig. 4, a section on the line *z z* of Fig. 2, and Fig. 5 a detail elevation of the indicator-drum.

Similar letters of reference indicate like parts in the several figures of the drawings.

a is the casing, on opposite sides of which are rigidly secured uprights *b*.

c is a cross-bar loosely journaled in the uprights *b* above the top of the casing, but held as against lengthwise movement by pins *d*, which pass through said bar. The ends of the cross-bar *c* are notched, as shown at *e* in Fig. 3, and the headed draft-pins *f* are loosely held within these notches by keeper-pins *g*. The said draft-pins have secured loosely in their lower ends bow-shaped clips *h*, the ends of which are inserted between the coils of the spring *j*.

k are draft-rods the upper ends of which are connected to the lower coils of the springs *j* by means of clips *l*, similar to the clips *h*, which are pivotally connected to the rods *k* by simply inserting said clips through perforations *m* in said rods. Each of the rods *k* has a series of these perforations *m*, so that a greater or lesser length of spring may be used, as the exigencies of the case require. The lower ends of the draft-rods are pivotally connected by a yoke *n*.

p are hollow bosses formed integral with the uprights *b*, within the outer extremities of which are adjustable bearings *r* for the shaft *s*. The ends of the shaft *s* are formed into cone-journals *t*, and the bearings *r* for this shaft are correspondingly shaped. *u* are set-screws for holding said bearings in place after a proper adjustment has been made.

v is an indicator-drum, which is rigidly secured to the shaft *s*. It is a very essential feature that the indicator-drum in scales of this nature should be made of very light material, for the reason that if it be not so made the sensitiveness and accuracy of the scales will be more or less affected. For instance, heretofore in scales of this character if a given quantity is weighed successively a number of times it will be found that said scales scarcely ever indicate the weight of such quantity twice exactly the same, there always being some slight variation in the amount registered. This is in a great measure due to the fact that the more the actual weight of the indicator-drum itself the greater must be the force necessary to operate it, and in order to overcome this disadvantage I have constructed the drum of thin skeleton frames *w*, of aluminum, while the periphery is formed of a thin sheet of

paper pasted to the frames. In this way I have secured a structure that is so light that the force necessary to operate it is almost insignificant.

a' is a cross-rod, to which is secured a screw *b'*. The screw *b'* passes loosely through the yoke *n*, as shown at Fig. 4, and has within its lower end a ring *c'*, from which the scale-pan *d'* is suspended.

Pivoted to the cross-bar *a'* are rack-bars *e'*, which engage pinions *f'*, rigid with the shaft *s*. The hollow bosses *p* are at one side slotted or cut away, as shown at *g'* in Fig. 3, so that the rack-bars may be permitted to engage the pinions *f'*.

h' are keepers, (but one shown,) which ensure the engagement of the rack-bars and pinions.

The ends of the cross-rod *a'* are notched, as shown at *j'*, and said ends embrace the edges of the draft-rods *k* in such manner as to be capable of sliding thereon.

k' is a slot in the yoke *n*, and within this slot is an adjusting-nut *l'*, which takes on the thread of the screw *b'*. *m'* is a set-screw on the lower portion of said screw. By revolving the nut *l'* the cross-rod *a'*, to which the screw *b'* is connected, will be caused to move up or down, as the case may be, carrying with it the rack-bars *e'*, which will, through the pinions *f'*, effect the rotation of the indicator-drum as may be desired. Thus should the scales when at rest indicate anything other than a perfect balance or zero, by turning the nuts *l' m'* the drum may be brought into proper relative position and there secured without disturbing the tension of the springs *j*. Should it be found necessary to increase or diminish the tension of the springs *j*, this may be easily effected by advancing the clips *h* along the coils of said springs after the manner of advancing a nut along a screw-thread. The lower portions of the uprights *b* are formed into guideways *b*2, through which the ends of the cross-rod *a'* and said draft-rods *k* pass, so that said rods will be properly guided in their movements.

The cross-bar *c* is provided with a ring-clip *p'*, by means of which the scales may be suspended from any suitable support.

Around the periphery of the drum *v*, at the central portion of the same, is a scale *r'*, (see Figs. 1 and 5,) indicating pounds and ounces.

s' are columns of figures parallel with the scale *r'* and arranged in alignment therewith, which indicate the total amount in money for which a commodity should be sold after it has been weighed.

t' is an opening in the face of the casing *a*, within which is

fitted a glass u', through which may be seen the figures on the periphery of the drug. The glass u' has printed or suitably inscribed thereon a series of figures v', which register with the columns of figures s' and indicate various prices per pound.

The central portion of the glass has marked thereon the abbreviations "P." and "Oz.," and the scale r' on the periphery of the drum is adapted to register with these characters. Supposing that some article which weighs exactly three pounds has been placed in the weighing-pan of the scales, the indicator-drum will be brought to a position where the figure 3 in the column of pounds on the sale of the drum will be disclosed to view, as shown in Fig. 1. Supposing, also, that the price of such article is eight cents per pound; the operator will consult the series of figures on the glass until the number 8 is reached, when immediately above it will appear the total value of the article—i. e., 24.

In Fig. 5 I have shown a detail view of the face of the drum, whereon the figures are inscribed, and the broad straight line w' shown in this figure is intended to show through the glass u' when the scales are at rest and at a balance or zero.

I am aware that computing-scales have heretofore been constructed wherein a drum or cylinder is employed having the divisions of the weight-scale and other figures on its periphery whereby the total selling price of an article may be determined without mental calculation on the part of the operator, and I am also aware that said drum has been operated by a rack-bar and pinion, and I therefore do not broadly make any claim to these features; but

What I do claim, and desire to secure by Letters Patent, is—

1. The combination of a casing a the uprights b rigid with the sides thereof, the cross bar c, the draft rods k connected at their lower ends by a yoke n, the springs interposed between said draft rods and cross bar in the manner specified, the indicato drum journaled within the uprights and carrying pinions which are engaged by rack bars, the cross rod a' to which the lower ends of the rack bars are connected, the screw b' depending from the cross rod and passing through the yoke n, and the set nuts on said screw, substantially as and for the purpose set forth.

2. The combination of the indicator drum constructed of thin skeleton frames of a very light material, the periphery of said drum being formed of a sheet of paper having the

divisions of the weight scale and other numerals printed thereon, the pinions carried by the shaft of said drum, adjustable conical bearings wherein said draft is journaled, the cross bar *c* having a suspending clip secured thereon, the headed draft pins supported loosely within the notched ends of the cross bar *c* after the manner of a stirrup connection, the bow shaped clips in the ends of the draft pins, the springs between the coils of which said clips are inserted, whereby the tension on said springs may be altered as described, the draft rods *k*, the yoke *n* whereby said rods are connected, the cross rod *a'* to which the rack bars are pivoted and whose ends are notched and embrace said draft rods so as to be capable of sliding thereon, a ring from which the scale pan is suspended, and suitable adjusting connections between the yoke *n* and said cross rod *a'*, substantially as described.

3. The combination of a casing *a*, the uprights *b* rigid with the sides thereof, the cross bar *c*, the draft rods *k* connected at their lower ends by a yoke *n*, the springs interposed between said draft rods and cross bar, the indicator drum journaled within the uprights and carrying pinions, the rack bars engaging with said pinions, the cross rod *a'* to which the lower ends of the rack bars are connected, and the pin *b'* pivoted to said cross rod and rigidly connected with the yoke *n* as to vertical movement and provided with means whereby a scale pan may be attached, substantially as set forth.

4. The combination of the cross rod *a'*, the springs connected at their upper extremities to a stationary part of the scale, the draft rods suspended from the lower extremities of said springs, the yoke connecting the lower ends of said draft rods, the pin *b'* pivoted to the cross rod *a'* and depending therefrom and provided at its lower extremity with means for attaching a scale pan said pan being rigidly connected with the yoke *n* as to vertical movement, the rotary weight indicating device, and means carried by the cross rod *a'* for operating said device, substantially as set forth.

5. An indicator drum for weighing mechanism, consisting of a spindle provided with a plurality of skeleton frames of light material and secured to said spindle, and having secured to their peripheries a sheet of paper forming a cylinder.

6. An indicator drum for weighing mechanism consisting of a spindle provided with a plurality of skeleton disks or frames of thin aluminum having a sheet of paper extending around and secured to their peripheries to form a cylinder.

7. The combination with balance springs and a draft rod

of a weighing apparatus, of a rack operated by said rod, and an indicator drum consisting of a spindle provided with a pinion engaging said rack, skeleton disks or frames of light material secured to said spindle and a sheet of paper extending around and secured to the peripheries of the disks to form a cylinder.

In testimony whereof I affix my signature in presence of two witnesses.

ALBERT U. SMITH

Witnesses:
A. M. WOOSTER
S. V. RICHARDSON.

State of Connecticut }
County of }

Albert U. Smith, the above named petitioner, being duly sworn, deposes and says that he does verily believe himself to be the original and first inventor of the improvements set forth and claimed in the foregoing specification and for which he solicits a patent; that deponent does not know and does not believe that said improvements were ever before known and used; that deponent is a citizen of the United States and resident of Seymour, in the County of New Haven and State of Connecticut; that deponent verily believes that the Letters Patent referred to in the foregoing petition and herewith surrounded are inoperative for the reason that the specification is defective and insufficient, and that such defects consist particularly in the inconsistency between the statement of invention and the claims, and the failure of said claims to particularly specify the real novelty of the invention; and deponent further says that the errors which render said patent so inoperative arose from inadvertence and without any fraudulent or deceptive intention on the part of deponent; that the following is a true specification of the errors which it is claimed constitute such inadvertence relied upon, viz: The statements of invention as given in lines 22 to 25 of page 1, and from line 81 of page 1 to line 2 of page 2 of the patent are not confirmed by the claims at the end of the specification, said claims being unduly restricted to the specific mechanism for adjusting the tension of the springs and for balancing the mechanism; deponent further says that such errors so particularly specified arose as follows: Deponent being ignorant in the matter of patent specifications left a model with his

attorney and explained the invention substantially as set forth in the lines of the specification above referred to and he then signed the papers which were prepared by his attorney supposing that the said statements would fully protect the invention; that very soon after the issue of the patent aforesaid and herewith surrendered the deponent commenced the manufacture of the scales and discovered on consultation with his partners that the patent under which they proposed to manufacture was inoperative and defective as aforesaid; and deponent further says that said discovery was not due to any competing enterprise; and deponent further says that he immediately took steps to remedy the defects by this application for reissue of the patent.

ALBERT U SMITH

Subscribed and sworn to before me this 25th day of January 1896.

A. M. WOOSTER
Notary Public.

(Notarial Seal)

(Endorsed) Serial No. 577074 Paper No. 1/2 Reissue Application Filed Jan 27 1896 A. U. Smith U. S. Patent Office. Jan 27 1896 Chief Clerk.

2—370.

No. 545,616

THE UNITED STATES OF AMERICA,

To all to whom these presents shall come:

Whereas Albert U. Smith of Seymour, Connecticut has presented to the Commissioner of Patents a petition praying for the grant of Letters Patent for an alleged new and useful improvement in Automatic Computing Scales.

He having assigned one half of his right, title, and interest in said improvement, to Edmond C. Smith, of Westport, Connecticut, a description of which invention is contained in the specification of which a copy is hereunto annexed and made a part hereof, and has complied with the various requirements of law in such case made and provided; and

Whereas upon due examination made the said claimant is adjudged to be justly entitled to a patent under the law;

Now therefore these Letters Patent are to grant unto the said Albert U. Smith and Edmond C. Smith, their heirs or assigns for the term of seventeen years from the third day of September one thousand eight hundred and ninety-five, the exclusive right to make, use, and vend the said invention throughout the United States and the Territories thereof.

In testimony whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed, at the City of Washington, this third day of September in the year of our Lord one thousand eight hundred and ninety-five, and of the Independence of the United States of America the one hundred and twentieth.

JNO M REYNOLDS
Assistant Secretary of the Interior

(Seal)
6—2035
Countersigned.
S. T. FISHER
Acting Commissioner of Patents.

(Stamped across face) Surrendered Surrendered Surrendered.

(Here follows Letters Patent No. 11,536, a copy of said Letters Patent heretofore set out in this record and not reproduced here.)

2—386.

M. H.

DEPARTMENT OF THE INTERIOR,

United States Patent Office.

To all persons to whom these presents shall come, Greeting:

This Is To Certify that the annexed is a true copy from the Digest of this Office of all Assignments, Agreements, Licenses, Powers of Attorney, and other instruments of writing, found of record up to and including January 17, 1896, under or relating to Letters Patent granted to Albert U. Smith, Seymour, Conn. Assignor of one half to Edmond C. Smith, September 3, 1895, No. 545,616. "Automatic Computing Scale."

In Testimony Whereof I John S. Seymour Commissioner of Patents, have caused the Seal of the Patent Office to be hereunto affixed this twentieth day of January, in the year of our Lord one thousand eight hundred and ninety-six, and of the Independence of the United States of America the one hundred and twentieth.

JOHN S. SEYMOUR
(Patent Office United States of America.) *Commissioner.*

W. D. S.

Assignor. Albert U. Smith.

Assignees. Edmond C. Smith. Westport, Conn.

Date of Assignment. May 4, 95.

Date of Record. June 21, 95.

Invention. Automatic Computing Scales. Filed May 2, 95. Ser. No. 577,927. Sep. 3, 95. 545,616.

Territory Assigned. One undivided half of his right, title, and interest in said invention. Patent to issue to said assignee for his interest. Consideration $1.

Book. W. 51

Page. 225.

(Endorsed) U. S. Patent Office Jan 27 1896 Chief Clerk. 7814-96. U. S. Patent Office, Copy Made Jany. 20, 1896.

2—260

Div. ____ Room 217 Paper No. _____

Address only "The Commissioner of Patents, Washington, D. C." J. P. H.

All communications respecting this application should give the serial number date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
United States Patent Office
Washington, D. C., March 5, 1896.

Mailed
Mar 5 1896
U. S. Patent Office.

Albert U. Smith,
Care A. M. Wooster,
Bridgeport, Conn.

Please find below a communication from the Examiner in charge of your application for Automatic Computing-Scales, filed Jan. 27, 1896, ser. no. 577,074.

JOHN S. SEYMOUR
Commissioner of Patents.

Claims 5 and 7 are rejected on patent #106,869, Aug. 30, 1870 to Phinney, Price Scales, it being old and a well known expedient for mechanics to provide skeleton metal frames instead of solid ones when the quality of lightness is desired and at the same time sufficient strength retained, those claims are not believed to set forth anything patentable over what is shown in the references.

Claim 6 is rejected on the same patent on the ground that to make disks or frames of aluminum is not believed to involve invention because the quality of lightness is a well known one of aluminum and that metal is now extensively used where lightness and strength is desired.

It is believed that aside from the references, the sworn statement filed by applicant is a sufficient showing to warrant the grant of a reissue. This conclusion has been reached in view of the fact that applicant has been prompt in coming back to the office and making application for reissue, and that the original patent contained in lines 22 to 25, page 1, and line 81 of page 1 to line 2 of page 2, together with the matter contained in claim 2, seems to show clearly that it was applicant's original intention to cover said matter in his claims. It is

further noted that no intervening rights so far as the office can determine have accrued, see Robinson on patents, paragraph 660 and the notes relating thereto.

J. T. NEWTON
Ex

C. C. B.

(Endorsed) Serial No. 577074 Paper No. 1 Rep. Dated March 5 1896

In re application of Albert C. Smith for patent Aut. Computing Scale. filed Jan 27 '96 Serial No. 577,074
Hon. Commissioner of Patents:
Sir:—In the matter of the above entitled application, please recognize Arthur W. Harrison of Washington, D. C. as my associate atorney with the usual powers.

A. M. WOOSTER
Attorney of Record.

(Endorsed) Serial No. 577074 Paper No. 2 Asso-Power Filed Mar. 11 1896 A. U. Smith Div. 23. Mar 11 1896 U. S. Patent Office.

Room 217.

Hon. Commissioner of Patents,
Sir:

In the matter of the application of Albert U. Smith, for reissue patent for "Automatic Computing Scales," filed January 27", 1896, Serial No. 577,074, I respectfully request a reconsideration and an allowance.

The patent to Phinney, cited by the Examiner, makes no mention of the material of which the two cylinders or drums D, D, are made. It is to be presumed, as more fully set forth during a personal interview to-day with the Examiner, that the said cylinders or drums are made of tin or other sheet metal.

The practical utility of devices of this character depends very essentially upon the lightness of the indicator drum, said drum, if made of sheet metal or other comparatively heavy material, possessing too much inertia to permit accuracy in its movement. In this connection see the paragraph at the bottom of page a of the specification and the top of page 3.

Claims 5, 6, and 7 of this application do not depend for novelty upon the fact that the frames are made of skeleton

metal or of aluminum, although these are desirable features, but upon the fact that the cylindrical portion of the drum is composed of a sheet of paper. It is the construction of this drum that forms the subject matter of claims 5, 6, and 7, not the mere provision of skeleton metal frames where solid frames had been heretofore used.

In view of the facts as above stated and as further set forth during the personal interview above mentioned, it is believed that the claims 5, 6, and 7 should be allowed.

Respectfully,

A. W. HARRISON
Associate Attorney.

Washington, D. C., March 11", 1896.

(Endorsed) Serial No. 577074 Paper No. 3 Argument Filed Mar. 11" 1896 A. U. Smith. Div. 23. Mar 11 1896 U. S. Patent Office.

2—184.

577,074

Address only
The Commissioner of Patents,
Washington, D. C.

DEPARTMENT OF THE INTERIOR,

United States Patent Office,

Washington, D. C., April 6, 1896

Albert U. Smith assor
C/o A. W. Harrison assoc
City

Sir:

Your application for Reissue of Patent No. 545,616 for Improvement in Automatic Computing Scales has been examined and allowed.

The patent will be forwarded to you as soon as practicable, in due order of business.

Very respectfully,

JOHN S. SEYMOUR
Commissioner of Patents.

4324b—4—09
Class (2—196.)
73. Measuring 1896
Instruments,
Price Scales. Contents:
½. Application 3 papers.
1. March 5 '96 Rejection
2. Asso-Power-atty Mar. 11/96
3. Argmt Mar. 11/96
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23.

Title:

Improvement in Automatic Computing Scales.

(Endorsed) Filed Jun 13 1912 at ..... o'clock ..... M. T. C. MacMillan clerk

DEFENDANTS EXHIBIT "FULLER FILE WRAPPER"

SOLON F. KLOTZ
Notary Public.

2—289.

UNITED STATES OF AMERICA.

Department of the Interior,

Patent Office.

To all persons to whom these presents shall come, Greeting:

This is to certify, That the annexed is a true copy from the Records of this office of the File Wrapper and Contents in the matter of the Letters Patent of Frederick Lincoln Fuller, Number 585,467, granted June 29, 1897, for Improvement in Cash Indicators.

In testimony whereof, I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the City of Washington this 31st day of May, in the year of our Lord one thousand nine hundred and five and of the Independence of the United States of America the one hundred and twenty-ninth.

F. I. ALLEN
Commissioner of Patents.

(Seal)

Amount Received
$15
Chief Clerk.

PETITION.

To the Commissioner of Patents:

Your petitioner Frederick L. Fuller citizen of The United States, residing at Waterbury in the County of New Haven, State of Connecticut, pray that Letters Patent may be granted to him for improvement in Cash Indicators as set forth in the annexed specification.

And I hereby appoint S. H. Hubbard, of Bridgeport, Conn., my Attorney with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to sign the drawings, to receive the Patent, and to transact all business in the Patent Office connected therewith.

Signed at Waterbury, in the County of New Haven, and State of Connecticut, this 12th day of January 1891.

FREDERICK L. FULLER

(Endorsed) Received 3 o'clock A. M. Jun 2 1905

SPECIFICATION.

To all whom it may concern:

Be it known, That I, Frederick Lincoln Fuller citizen of The United States, residing at Waterbury in the County of New Haven, and State of Connecticut, have invented certain new and useful improvements in Cash Indicators and I do hereby decare the following to be a full, clear and exact description of the invention, such as will enable other skilled in the art to which it appertains, to make and use the same.

This invention relates to certain novel and useful improvements in cash registers and indicators, but is more particularly designed as an improvement upon the construction shown and described in certain letters patent of the United States granted to me jointly with George H. Griswold the 4" day of Feb-
†and numbered 420,554 and 420,555
May 9/93 ruary 1890. ^ In the patents just referred to a set of indicating wheels is provided by means whereof the sum indicated may be shown to the purchaser,

†Matter in small type, inserted in red ink in original transcript.

but these wheels are visible from one side of the machine only. In my present invention the case is provided with openings both at the front and at the rear, and two sets of indicating wheels are mounted therein and so connected together that the amount indicated appears both at the front and the rear side of the machine with the figures both right side up and reading properly, that is, from left to right. With these ends in view, my invention consists in the arrangement and the connection of the indicators, and also in the details of construction and the several combinations of cooperating elements hereinafter to be fully and in detail explained, and then recited in the claims.

In order that those skilled in the art to which my invention appertains, may fully understand its construction and method of operation, I will describe the same in detail, reference being had to the accompanying drawings which form a part of this specification, and in which,

Figure 1, is a plan view of a machine embodying my invention, the case being removed,

Figure 2, an end elevation, the case being sectioned,

Figure 3, a horizontal section on the line x—x of figure 2,

Figure 3, a partial rear elevation, and

Figure 5, a detail of one of the pnsh rods.

Like numerals denote the same parts in all the figures of the drawings.

1 represents the enclosing case. Within this case are fulcrumed a number of operating levers 2, each provided with a toothed segment 3, and an operating handle 4. These mesh with and are adapted to operate gears 5, which in turn take into a segment or partial gear 6 mounted upon a shaft 7. *(*This construction is in some respects like that shown in the patent above referred to, but is more nearly akin to the arrangement shown and described in a certain pending application filed by me on the 16" of August 1890, serial number 362,180.)* As will of course be readily understood, the number of the partial gears 6 is equal to the number of the operating levers. In the present case that number is four. 8 is a shaft journaled between the ends of the case or frame. This shaft affords a bearing for eight

Erased May 9/93

*Matter in italics in parentheses, stricken out in original transcript.

indicating wheels, four of which have their figures so arranged as to show right side up at the openings on one side of the case, and the alternate four are adapted to show in front of the openings in the other side of the case. In order that these may be clearly distinguished I have denoted those which appear at one side by the numerals 9, 10, 11 and 12, and those which appear at the other side by 13, 14, 15 and 16. Each of the wheels 9, 10, 11 and 12 carries a gear 17 which meshes with and is operated by one of the partial gears 6. Each of the wheels, except the two central wheels which will presently be described, is provided with a gear 18 affixed to the side thereof, and a little larger in diameter than the wheel. 19, 20 and 21 are shafts journaled between the ends of the frame; each carries two pinions 22. The pinions on the shaft 19 engage with the gears 18 upon the wheels 9 and 16. The pinions upon the shaft 20 in like manner engage the gears 12 and 13, and the pinions upon the shaft 21 engage with the gears upon the wheels 10 and 15, so that movement applied to any of these wheels will be transmitted through the shaft and pinions to one other wheel of the series. It will be observed that there are four couples of wheels, but only three shafts. The two wheels 11 and 14 lying together are simply connected so as to operate as one part, their contiguity rendering the shaft unnecessary. The operation of this part of my invention may be best described by supposing that an amount, say $1.47, is to be indicated and totalized. To do this the units operating lever is depressed by means of the 7 handle. Said lever through the gears 5 and 6 operates the wheel 9 so that the figure 7 thereon is brought in front of the opening in the case next the operator. This movement of the wheel 9, however, through the gears 18, pinions 22, and shaft 19, operates the wheel 16 at the other end of the case so as to bring the figure 7 in front of that opening which is in the units space when viewed from the side of the machine away from the operator. The tens or dimes lever is then depressed by means of the 4 handle, whereupon the wheel 10 shows 4 to the operator, and the wheel 15 shows 4 in the tens space at the rear of the machine. Then in like manner the dollars or hundreds lever is depressed by the 1 handle, thereby so moving the double wheel 11-14 that the figure 1 appears on both sides on the hundreds place.

May 9/93 **(In the pending application heretofore referred to †a shutter 23 is there is shown and described a shelter ∧ pivotally hung and capable of operation over the periphery of the several wheels so as to be interposed between the visual openings in the case and the figures on the case, or to be withdrawn from that position. (In the present application I make use of a shutter 23, †this shutter 23 is but the same is) ∧ double, one side thereof operating across the openings in one side of the case, and the other operating across the openings in the other side* Erased May 9/93 *of the case. (This shutter is operated in substantially the same manner described in the pending application.) It is shown in its closed position in figure 2, the dotted line a indicating its open position.*

While the indicating devices as shown consist of Sub B May 18/95 *wheels, I do not wish to be limited in this regard, since the idea of my invention can be carried out either by means of segments, tablets or other indicators.*

I claim,

1. In a cash indicator, a duplicate set of indicating devices, one set adapted to show in front and the other at the rear of the machine, in combination with means for operating one set of said indicating de- Substitute A May 9/93 *vices, and connections, between each indicating device and the corresponding device of the other set, whereby the amount indicated appears in proper position and relation at both sides of the case, substantially as specified.*

2. In a machine of the character described, the combination with double set of indicating wheels, and means for operating one set, of connections interposed between each wheel and its corresponding wheel, whereby the amount indicated appears in proper position at both sides of the case.

3. In a machine of the character described, a double set of indicating wheels, one set visible from one side of the case, and the other from the other, in combination with connections between each pair of similar wheels, whereby the same amount is shown at both sides of the case, substantially as described.

4. In a machine of the character described, a series of in-

*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

dicating wheels representing units, tens, hundreds, etc., and adapted to show on one side of the case, in combination with a similar set of wheels having numbers in reverse and visible from the other side of the case, and operative connections between each similar pair of wheels, and means for operating one set of said wheels, substantially as set forth.

5. *In a cash indicator, the combination with a set of indicating wheels visible from one side of the case and representing units, tens, hundreds, etc., and means for operating said wheels, gears carried by said wheels, a similar set of wheels in reverse and provided with gears, shafts extending transversely contiguous to the wheels and bearing pinions engaging the gears, whereby each wheel is operatively connected with a similar wheel, substantially as described.*)*

In testimony whereof I affix my signature, in presence of two witnesses.

FREDERICK LINCOLN FULLER

SHERMAN HARTWELL HUBBARD
M. C. HINCHLIFFE

OATH.

State of Connecticut } ss.
County of New Haven }

I, Frederick L. Fuller the above named petitioner, citizen of The United States and resident of Waterbury, in the County of New Haven and State of Connecticut, being duly sworn, depose and say that I verily believe myself to be the original, first and sole inventor of the improvement in Cash Indicators described in the foregoing specification; that the same has not been patented to me nor to others, with my knowledge or consent, in any country, that the same has not to my knowledge been in public use or on sale in the United States for more than two years prior to this application; and I do not know and do not believe that the same was ever known or used prior to my invention thereof.

FREDERICK LINCOLN FULLER.

Sworn to and subscribed before me, this 12th day of January 1891.

SHERMAN H HUBBARD
Notary Public.

(Notarial Seal).

*Matter in italics in parentheses, stricken out in original transcript.

(Endorsed) Serial No. 380411 Paper No. 1 Application Filed Feb. 6 1891 F. L. Fuller U. S. Patent Office Feb 6 1891 Chief Clerk.

Fred L. Fuller,
Cash Indicator.
No. 380,411,
Filed Feb. 6" 1891.
Hon. Commissioner of Patents,
Sir:—

Please recognize Messrs. Pennie & Goldsborough, of Washington, as associate attorneys in the application above entitled.

Very respectfully,
S. H. HUBBARD

March 4" 1891.
Dic.
WH

(Endorsed) No. 380411 Paper No. 1 Asso. Power of Atty Filed Mar. 6 1891 F. L. Fuller U. S. Patent Office Mar 6 1891 Division XXIII.

DEPARTMENT OF THE INTERIOR,
United States Patent Office,

May 9—91.
Mailed " 10 "

Frederick L. Fuller
C/o Pennie & Goldsborough
City
Cash Indicator
Filed Feb 6—91
No. 380411

This application has been taken up in its turn for examination. Applicant has neglected to give the number of the patent mentioned on page 2. For a description of the operation of the shutter the examiner is referred to another pending application. This reference is contrary to the practice of this office as expressed in ex parte Borgfeldt C. D. '89 page 199 and must be canceled. The claims presented are met in any of the following patents: Lovell 445959, Kosh 398625, Patten, 312014, Paterson 383006 & Munnell 354483 all in Cash Registers Rotating Indicators

F. A. SEELY
Ex

Quinby

(Endorsed) Serial No. 380411 Paper No. 2 Rej Dated May 9 1891.

Hon. Commissioner of Patents,
Sir:—

We hereby withdraw as Associate Attorneys in the matter of the application of F. L. Fuller, filed Feby. 6, 1891, Serial Number 380,411, for Improvements in Cash Indicator. Please address all communications relating thereto to the principal attorney of record.

Respectfully,
PENNIE & GOLDSBOROUGH

(Endorsed) Serial No. 380411 Paper No. 3 Withdrawal of Asso. Atty. Filed June 15, 1892. F. L. Fuller U. S. Patent Office Jun 15 1892 Division XXIII.

Hon. Commissioner of Patents:

Sherman H. Hubbard, lately my attorney in my application filed Feb. 6, '91 for patent for improvements in cash indicators, Serial Number 380,411, being deceased, please recognize Francis C. Lowthorp, of Trenton, New Jersey, as my attorney in said matter whom I hereby substitute for said Sherman H. Hubbard, deceased, with the same power to act for me in all particulars.

FREDERICK L. FULLER

(Endorsed) Serial No. 380411 Paper No. 4 Power of atty Filed May 6" '93 F. L. Fuller U. S. Patent Office May 6 1893 Division XXIII.

IN THE UNITED STATES PATENT OFFICE.

Application of
F. L. Fuller,
Filed Feby. 6, 1891.
Serial Number 380,411.
} Cash Indicators.

Hon. Commissioner of Patents,
Sir:—

In the matter of the above entitled application we hereby amend as follows:

Page 2, line 6, after "1890" insert |—and numbered 420,554, and 420,555.|

Page 3, cancel sentence beginning with the word "This", line 9, and concluding with "362,180", line 13.

1025

Page 5, cancel from line 2 to the word "shutter" line 3, inclusive, and insert; |A shutter 23 is.|

Page 5, cancel from "In" line 6, to "same" line 8, inclusive and insert |"This shutter 23 is".|

Page 5, cancel sentence beginning "This shutter" line 10 and ending with "application" line 12.

Page 5, cancel lines 14, 15, 16, 17.

Cancel the claims and insert:

A Canceled per B May 18/95

•(*1. In a cash indicator the combination with a double set of indicating wheels and means for operating one set, of a common shaft upon which both sets are mounted, the corresponding wheels (as 11, 14) of the highest decimal notation of the two sets being adjacent to each other, and connected directly together, and the corresponding wheels of the several lower decimal notations being connected by cross-gearing; substantially as described.*

2. In a cash indicator the combination with a double set of indicating wheels and means for operating one set, of a common shaft upon which both sets are mounted, the corresponding wheels (as 11, 14) of the highest decimal notation of the two sets being adjacent to each other and connected directly together, and the wheels of the several lower decimal notations being provided at their peripheries with cog teeth, and cross shafts provided with cogs connecting the peripheral cog teeth of the wheels of corresponding lower decimal notation; substantially as described.

3. In a cash indicator, a double set of indicating wheels, one set visible from one side of the case, and the other set from the other side, in combination with connections between each pair of similar wheels whereby the same amount is shown on both sides of the case, a case having front and rear openings through which the indications are read, and a shutter normally closing both openings and provided with means for simultaneously uncovering both; substantially as described.)

Respectfully Submitted,
F. C. LOWTHORP
Atty

(Endorsed) Serial No. 380,411 Paper No. 5 Amdt A Filed May 9" 1893 F. L. Fuller U. S. Patent Office May 9 1893 Division XXIII.

•Matter in italics in parentheses, stricken out in original transcript.

DEPARTMENT OF THE INTERIOR,

United States Patent Office,

Washington, D. C. May 19, 1893.

Mailed " 20, "

Frederick L. Fuller,
c/o Francis C. Lowthrop,
Trenton, N. J.

Cash Register & Indicators.
Filed Feb. 6, 1891
#380411.

A complete description of how the shutter 23 is operated must be inserted in the specification.

Claims 1 & 2 are not true as stated, as it is the corresponding wheels of the next to the highest decimal notation of the two sets that are adjacent to each other and connected directly together.

F A SEELY

J. H. McE.

(Endorsed) Serial No 380411 Paper No. 6 Dated May 19 1893

2—186 a.

Ser. No. 380411

NO ASSIGNMENTS

Found of record affecting this application.
Examined up to and including Oct. 2, 1893
This certificate dated Oct. 3, 1893

F. V. BOOTH,
Chief of Div. D.

13073 b—5 m

2—075.

DEPARTMENT OF THE INTERIOR,

United States Patent Office,

Washington, D. C., Oct. 2, 1895.

To the Chief of the Assignment Division:

You will please make a statement of what is shown in the "Assignment Records" relating to the condition of the title to the alleged invention involved in the application referred to in the paper hereto annexed. You will attach such statement to such annexed paper and transmit the same to the "Docket Clerk" on or before the ..... day of ....., 190....

JOHN S. SEYMOUR
Commissioner of Patents.

The Hon. Commissioner of Patents,

Sir:

I hereby revoke any and all powers of Attorney heretofore given in the matter of my application for Improvement in Cash Indicator filed, February 6 1891, Serial Number 380,411, and hereby appoint Moritz B. Philipp, Henry T. Munson and Myron H. Phelps (of the firm of Philipp, Munson & Phelps, Temple Court, 7 Beekman Street, New York, N. Y., P. O. Box 1648) my Attorneys, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the Patent, and to transact all business in the Patent Office connected therewith.

Signed at Trenton N. J., this 29th day of September A. D. 1893.

FREDERICK L. FULLER

The Union Cash Register Company assents to the foregoing.

THE UNION CASH REGISTER CO
by FRANK O. BRIGGS
President

(Endorsed) Serial No. 380,411 Paper No. 7 Rev & Power of Atty Filed Oct. 2, 1893 Accepted: S. T. Fisher Act'g Commr. Oct. 3, '93. United States Oct 2 1893 Patent Office U. S. Patent Oct 2 1893 Office.

Duplicate

2—069.

All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

DEPARTMENT OF THE INTERIOR,
United States Patent Office,
Washington, D. C., Oct. 4, 1893.

Sir:

You are hereby informed that Your Power of Attorney Has Been Revoked in the matter of the application of Fredk L. Fuller for Letters Patent for an Improvement in Cash Indicator No. 380,411 Filed Feb 6, '91

Very respectfully,
JOHN S. SEYMOUR
Chief Clerk.

FRANCIS C. LOWTHROP
Trenton, N. J.

2—070.

All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

DEPARTMENT OF THE INTERIOR,
United States Patent Office,
Washington, D. C., Oct. 4, 1895.

Sir:

You are hereby informed that Your Power of Attorney Has Been Accepted in the matter of the application of Fredk L. Fuller for Letters Patent for an Improvement in Cash Indicators No. 380,411 Filed Feby. 6, 1891

Very respectfully,
JOHN S. SEYMOUR
Commissioner of Patents.

PHILIPP, MUNSON & PHELPS
Temple Court
N. Y. City

(Endorsed) Serial No. 380411 Paper No. 8 Notice of Rev & Accept. of Power of Atty Dated Oct. 4 1893.

New York, May 16, 1895.

In the matter of the application of
F. L. Fuller, Cash Register, Filed
February 6, 1891, No. 380,411

Hon. Commissioner of Patents,
Washington, D. C.

Sir:—

We hereby amend as follows:—

Cancel from line 2, page 5 to end of specification and insert:—

"Each segment 3 is provided with a detent 24 carried by a sleeve 25 mounted loosely upon a longitudinally movable shaft 26, for preventing return of the handles 2 after they have been depressed. The detents 24 are held yieldingly in engagement with their respective segments
B by springs 27 secured to the sleeves and engaging the under face of a plate or strip 28 extending across the machine. Each segment is also provided with a flat helical spring 29 connected at one end to a stationary shaft or rod 30 extending across the rear of the machine and flexibly connected by means of a chain 31 to studs 31ª on the operating lever of the segment eccentrically to its center.

The detents 24 are held normally in engagement with their segments by a spring 32 between the end of shaft 26 and the frame of the machine. They are thrown out of engagement therewith by a rod 33 extending outside the machine and rearwardly therein and provided at its inner end with an inclined or cam shaped portion 34 which upon the inward movement of rod 33 engages a pin 35 projecting downwardly from a bracket or arm 36 secured to the end of shaft 26. Upon the inward movement of rod 33, therefore, its inner end engaging pin 35 will move the arm 36 and with it the shaft 26 toward the frame of the machine (from left to right, Figure, 4) against the pressure of spring 32, thus moving the detents 24 carried by said shaft sideways out of engagement with the segment. Upon the withdrawal of the rod 33 the parts, including the shaft, the detents and the arm 36, are all returned to normal position by the spring 32.

In connection with the indicating devices and the sight openings through which the indications are read is employed a shutter 23 consisting of a plate for each sight opening (two being shown in the present case) connected to sleeves or hubs

37, 38 loosely mounted on shaft 8. The hub 37 is provided with a notch or tooth 39 which is engaged by a corresponding tooth or notch 40 upon the upper end of a lever 41 fulcrummed upon shaft 7 and extending downwardly into position to be engaged by a pin 42 upon the inner end of a longitudinally movable rod 43 similar to the rod 33 but on the opposite side of the machine. Beneath the foot of lever 41 and extending across the machine at its rear is a longitudinally movable shaft or locking bolt 44, one end of which is cut away slightly to permit the passage of the foot of the lever and the other end of which is provided with a spring 45 which when the lever 41 has been moved rearwardly sufficiently to bring a recess 46 in the foot of the lever into register with shaft 44 moves the shaft longitudinally through and into engagement with said recess so as to lock the lever against further movement in either direction.

The shaft 44 is disengaged from the lever 41 so as to release the shutter by the bracket 36 which engages a collar 47 on said shaft and which when moved sideways by the rod 33 as before described also moves said shaft in the same direction against the pressure of spring 45 until the cut away portion of shaft 44 again registers with the foot of the lever when a spring 48 connected to the lever and to the frame of the machine returns the lever to normal position.

In connection with the indicating mechanism also there is employed a locking mechanism operated from the shutter operating mechanism for locking the indicating mechanism when the shutter is moved to expose the indication and while it retains that position. This locking mechanism consists of locking plate 49 extending across the machine and supported from arms 50 loosely mounted on shaft 7. The locking plate 49 is held normally elevated out of locking position by a spring 51 connected to the plate and the frame of the machine, and is depressed to locking position into engagement with gear 5 by a pin 52 carried by lever 41 which, when the foot of said lever is moved rearwardly by rod 43, engaging one of the arms 50, moves the latter and the plate 49 downwardly into engagement with the gear and holds the plate in that position until the shutter mechanism is released and returned to normal position.

The locking plate 49 is also adapted to be operated each time one of the handles 4 is depressed from a stop plate 53 pivoted by arms 54 to the rear of the machine and connected by links 55 to the arms 50 supporting the locking plate 49.

The stop plate 53 by engaging the hand of the operator arrests the downward movement of the handles 4 but is itself slightly depressed when the hand comes in contact with it. When thus depressed it moves the locking plate 49 into engagement with the gear 5 and when relieved of the pressure of the hand it, with the locking plate, is returned to normal position by spring 51.

The operation is as follows:—When the handles 4 have been depressed to make an indication as before described, the handles depresesd will be prevented from returning by the detents 24 the shutter during this operation remaining in its normal position closing the sight openings. To expose the indication the operator will shove the rod 43 inwardly and through the pin 42 rock the lever 41 on its fulcrum into engagement with shaft 44 as before described. During this movement the upper end of the lever engaging the hub or sleeve of the shutter 23 will rock the latter from its horizontal position to that indicated by the dotted line in Figure 2, thus uncovering the openings in front of the indicating wheels. Simultaneously with this movement of the shutter the pin 52 engaging the arms 50 will through the latter move the locking plate downwardly into engagement with the gears 5, thus locking the indicating mechanism against operation. The parts are held in this condition so long as shaft 44 remains in engagement with the recess 46 in the foot of lever 41. To disengage said shaft and lever the operator will press the rod 33 inwardly into engagement with arm or bracket 36, which is as before described thus thrust aside, and through it move the shaft 44 longitudinally against its spring 45 and out of engagement with lever 41, which is then, with the shutter 23, returned to normal position by the spring 48. Simultaneously the shaft 26 with the detent carrying sleeves 25 thereon is also moved longitudinally against its spring 32 thus moving the detents 24 sideways out of engagement with their segments to permit the springs 29 to return the segments and indicator wheels to normal position, when the rod 33 retracted by its spring 56 is disengaged from arm 36 and permits shafts 26 and 44 to retume their normal positions and the detents 24 to re-engage their segments 3.

Connected to each detent carrying sleeve 25 except the last is a detent 57 for engaging the next adjoining segment to the left to prevent simultaneous movement of adjoining segments. The detents 57 are normally disengaged from their segments but as soon as one segment is actuated and throws its detent

24 upward the detent 57 carried by the sleeve of that detent is thrown upwardly into engagement with the next adjoining segment.

The rods 33, 43 are supported and guided in their backward and forward movements by bosses 58 secured to the frame and the rod 43 is also provided with a retracting spring 59 confined like the spring 56 of rod 33 between a collar 60 on the rod and one of its supporting and guiding bosses 58. A stop 61 is also provided in the side frame of the machine which engages the upper sides of arms 50 of locking plates 49 to limit the upward movement of the latter.

Registering mechanism is also provided consisting of disks 62, 63, 64, 65 representing respectively units, tens, hundreds and thousands, operated respectively from the units, tens, &c. indicating mechanisms. The registering disk of each series is operated by the gear 5 of that series through suitable pawl and ratchet mechanism and pinions 66 during the movement of the indicating mechanism in indicating direction; suitable transfer mechanism being interposed between the respective registering disks for carrying amounts from one to the other."

Cancel the claims and insert the following:—

What I claim is:—

Dec. 3/95 *(*1. The combination with indicating* †*and registering* ∧ *devices and operating arms for actuating said indicating* †*and registering* ∧ *devices, of a shutter normally obstructing the view of the indicating devices, and means disconnected from said operating arms for operating the shutter to disclose the indication, substantially as described.*

" *2. The combination with indicating devices and operating arms for actuating said indicating devices, of a shutter for obstructing the view of the indicating devices, means disconnected from said operating arms for operating the shutter, means for locking said shutter when thus operated against return movement, and means disconnected from said operating arms for releasing the shutter, substantially as described.*

B Sub D June 22/96

Dec. 3/95 *3. The combination with indicating* †*and registering* ∧ *devices and*

*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

" *operating arms for actuating said indicating* †and registering ∧ *devices, of a shutter for obstructing the view of the indicating devices, a lock for locking the indicating devices, a lever for operating the shutter, and connections between said shutter lever and lock for simultaneously operating the lock when the shutter is operated, substantially as described.*

Dec. 3/95 4. *The combination with indicating* †and registering ∧ *devices and operating arms for actuating said indicating* †and registering ∧ *devices, of a shutter for obstructing the view of the indicating devices, a lock for locking the indicating devices, a lever for operating the shutter, connections between said shutter lever and lock for operating the lock when the shutter is operated, means for locking the shutter and lock against return when thus moved, and a rod for releasing the shutter and lock, substantially as described.*

5. *The combination with indicating* †and registering ∧ *devices and operating arms for actuating said indicating* †and registering ∧ *devices, of a shutter for obstructing the view of the indicating devices, a lever adapted to operate the shutter and a push rod independent of the operating arms for operating the shutter lever, substantially as described.*

6. *The combination with indicating devices and operating arms for actuating said indicating devices, of a shutter for obstructing the view of the indicating devices, a lever adapted to operate the shutter, a push rod independent of the operating arms for operating the shutter lever, a lock for locking the shutter when thus moved against return movement and a second push rod also independent of the operating arms for releasing the shutter, substantially as described.)*

Dec 3/95 7. The combination with indicating †and registering ∧ devices, a shutter for obstructing the view of the indicating †and registering ∧

*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

" devices, and a lever for actuating the shutter, of a locking bolt for engaging and locking the shutter against return when operated, and a push rod and connections for releasing the shutter, substantially as described.

" 8. The combination with indicating †and registering devices, detent mechanism for engaging and preventing return

" of the indicating †and registering devices when operated, a shutter for obstructing the view of the indicating devices and a lever for actuating the shutter, of a locking bolt for engaging and locking the shutter against return when operated, and a push rod and connections for releasing the shutter and throwing the detent mechanism out of engaging position, substantially as described.

9. The combination of two sets of indicating wheels arranged in pairs, one pair (as 11, 14) being connected directly together and the other pairs connected each independently of the other by gearing, and means for operating one set of the in-
Insert C dicating wheels substantially as described.
Dec 3/95 C

10. The combination of two sets of indicating wheels representing similar decimal notations and arranged in pairs, the wheels of one set alternating with those of the other in reverse order, one pair of said wheels (as 11, 14) being connected directly together, and the other pairs connected each independ-
Insert ently of the other by cross gearing, and means for
C' operating one set of the indicating wheels, substan-
Dec 3/95 tially as described. C'

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11. 15. The combination of two sets of indicating wheels arranged in pairs, one set visible from one side of the case, and the other set from the other side, connections between each pair of similar wheels whereby the same amount is shown on both sides of the case, a shutter normally obstructing the view of said indicating wheels, means for actuating said shut-
Dec ter to simultaneously expose the indication, and

†Matter in small type, inserted in red ink in original transcript.

3/95 †independent of said shutter actuating means means ∧ for operating one set of the indicating wheels, substantially as described.

FREDERICK L. FULLER
by PHILLIPS MUNSON & PHELPS
Attys.

We have instructed Mr. Georgii of Washington to correct the drawings to agree with the specification as amended.
PHILLIPPS MUNSON & PHELPS

State of New Jersey } ss:—
County of Mercer, }

F. L. Fuller, whose application for letters patent for an improvement in Cash Registers, serial number 380,411, was filed in the United States Patent Office on or about February 6, 1891, being duly sworn deposes and says that he verily believes himself to be the original and first inventor of the improvement as described and claimed in the foregoing amendment, in addition to that which was embraced in the claims originally made, and that he does not know and does not believe that the same was ever before known or used, and that the matter sought to be inserted formed a part of his original invention at the date of filing said application, and was invented by him before he filed the same.
FREDERICK L. FULLER

Sworn to be subscribed before me this 17″ day of May, 1895.
LOUIS C. TAYLOR
(Notarial Seal). *Notary Public of New Jersey.*

(Endorsed) Serial No. 380,411 Paper No ½ Amendment B. Filed May 18″ 1895 F. L. Fuller Div. 23. May 18 1895 U. S. Patent Office.

†Matter in small type, inserted in red ink in original transcript.

2—260.

Div. ..... Room 256 Paper No. .....

All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

All communications respecting this application should give the serial number, date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
United States Patent Office,
Washington, D. C., June 3, 1895.
Mailed " " "

F. L. Fuller,
C/o Philipp, Munson and Phelps,
Temple Court, New York City.

Please find below a communication from the Examiner in charge of your application, for Cash Registers filed Feb. 6, 1891, Serial Number 380,441.

JOHN S. SEYMOUR
Commissioner of Patents.

Claims 1, 2, 3, 4, 5, 7, and 8 are rejected on reference to the structure shown in the patent to Maskelyne, No. 436,500, Sept. 16, 1890, in Cash Registers.

Claims 9 and 10 are rejected on reference to the patent to Koch of Record. In claim 10 the fact that the wheels of one set alternate with those of another is deemed immaterial as it would be a mere choice of construction.

Claim 11 must be rejected on reference to the patent to Koch and Maskelyne above cited, it being deemed no invention to arrange a shutter upon Koch's structure in view of the one shown by Maskelyne.

J. T. NEWTON
Ex

J. H. McE

(Endorsed) Serial No. 380411 Paper No. 11 Rej. Dated June 3 1895

New York, December 2, 1895.

In the matter of the application of
F. L. Fuller, Cash Register, filed
February 6, 1891, No. 380,411.

Hon. Commissioner of patents,
Washington, D. C.

Sir:

We hereby amend as follows:—

Claim 1, line 1, after "indicating" insert "and registering".

Same claim, line 2 after "indicating" insert "and registering".

Claim 3, line 1, after "indicating" insert "and registering".

Same claim, line 2, after "indicating" insert "and registering".

Claim 4, line 1, after 'indicating" insert "and registering".

Same claim, line 2, after "indicating" insert "and registering".

Claim 5, line 1, after "indicating" insert "and registering".

Same claim, line 2, after "indicating" insert "and registering".

Claim 7, line 1, after "indicating" insert "and registering".

Same claim, line 2, after "indicating" insert "and registering".

Claim 8, line 1, after "indicating" insert "and registering".

Same claim, line 2, after "indicating" insert "and registering".

Claim 9, at the end of same, and before "substantially", insert "a shutter for each set of indicating wheels,

and means for actuating the same independently of the
C means for actuating the indicating wheels,"

Claim 10, at end of same, and before "substantially" insert "a shutter for each set of indicating wheels and means for actuating the same independently of the means
C' for actuating the indicating wheels.

Claim 11, line 2, after "means" insert "independent of said shutter actuating means"

As now presented, it is respectfully submitted, these claims clearly distinguish from the references cited and cover patentable subject matter, and they should, therefore, be allowed.

Respectfully,

F. L. FULLER
By PHILIPP MUNSON & PHELPS
Attorneys.

(Endorsed) Serial No. 380,411 Paper No. 12 Amendment C. Filed Dec. 3rd 1895 F. L. Fuller Div 23 Dec 3 1895 U. S. Patent Office United States Dec 3 1895 Patent Office.

2—260.

Div. ..... Room 217. Paper No. .....

All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

All communications respecting this application should give the serial number, date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
United States Patent Office,

J. P. H.

Washington, D. C., January 6, 1896.
Mailed " " "

Frederick L. Fuller,
Care Phillipp, Munson & Phelps,
Temple Court, New York, N. Y.

Please find below a communication from the Examiner in charge of your application, for Cash Indicators, filed Feb. 6, 1891, ser. no. 380,411

JOHN S. SEYMOUR
Commissioner of Patents.

Claims 1 to 11 must be rejected upon the references and for the reasons of record, the amendments to claims 1 to 8 not limiting them in their material structure and the amendments to claims 9, 10 and 11 not covering anything patentable in view of the structure shown in the patent to Yoe #388,518, Aug. 28, 1888 in Cash Registers, Rotating Indicators, it being deemed no invention to substitute the form of blind employed by Yoe and actuate it manually.

J. T. NEWTON
Ex

Dictated by J. H. McE.

(Endorsed) Serial No. 380411 Paper No. 13. Rej. Dated Jan. 6, 1896.

New York, May 6, 1896.

In the matter of the application of
F. L. Fuller, Cash Register, filed
February 6, 1891, No. 380,411.
(Room 256).

Hon. Commissioner of Patents,
Washington, D. C.

Sir.—

We hereby amend as follows:—

Erase claims 1 to 10 annd insert:—

Oct. 28/96 D

"1. The combination with indicating and register-ing devices and operating arms therefor, of a †pivot ^ shutter normally obstructing the view of the indicating devices so as to conceal the indication, and means disconnected from and operated independently of the operating arms for operating the shutter to disclose the indication, substantially as described.

Oct 28/96

2. The combination with indicating and register-ing devices and operating arms therefor, of a †pivoted ^ shutter normally obstructing the view of the indicating devices so as to conceal the indication, means disconnected from and operated independently of the op-

†Matter in small type, inserted in red ink in original transcript.

erating arms for operating the shutter to disclose the indication, and means for retaining the shutter in exposing position, substantially as described.

Oct 28/96 "3. The combination with indicating and registering devices and operating arms therefor, of a †pivoted shutter normally obstructing the view of the indicating devices so as to conceal the indication, means disconnected from and operated independently of the operating arms for operating the shutter to disclose the indication, means for retaining the shutter in exposing position, and means for releasing the shutter, substantially as described.

"4. The combination with indicating and registering devices and operating arms therefor, of a shutter normally obstructing the view of the indicating devices so as to conceal the indication, and a push rod disconnected from and operated independently of the operating arms for operating the shutter to disclose the indication, substantially as described.

"5. The combination with indicating and registering devices and operating arms therefor, of a shutter normally obstructing the view of the indicating devices so as to conceal the indication, a push rod disconnected from and operated independently of the operating arms for operating the shutter in exposing position, substantially as described.

6. The combination with indicating and registering devices and operating arms therefor, of a shutter normally obstructing the view of the indicating devices so as to conceal the indication, a push rod disconnected from and operated independently of the operating arms for operating the shutter to disclose the indication, a lock for retaining the shutter in exposing position, and a second push rod for disengaging said lock to release the shutter, substantially as described.

7. The combination with indicating and registering devices and operating arms therefor, of a shutter normally obstructing the view of the indicating devices so as to conceal the indication, means disconnected from and operated independently of the operating arms for operating the shutter to disclose the indication, a lock for engaging and locking said indicating devices, and connections between the shutter mechanism and said lock for operating the latter upon the opera-

†Matter in small type, inserted in red ink in original transcript.

tion of the shutter to expose the indication, substantially as described.

8. The combination with indicating and registering devices and operating arms therefor, of a shutter normally obstructing the view of the indicating devices so as to conceal the indication, means disconnected from and operated independently of the operating arms for operating the shutter to disclose the indication, a lock for engaging and locking said indicating devices, connections between the shutter mechanism and said lock for operating the latter upon the operation of the shutter to expose the indication, a lock for retaining the shutter in exposing position, and means for disengaging said shutter lock to release the shutter, substantially as described.

9. The combination with indicating and registering devices and operating arms therefor, of a shutter normally obstructing the view of the indicating devices so as to conceal the indication, means disconnected from and operated independently of the operating arms for operating the shutter to disclose the indication, a lock for engaging and locking said indicating devices, connections between the shutter mechanism and said lock for operating the latter upon the operation of the shutter to expose the indication, detents for engaging and preventing return movement of the indicating devices, and means for simultaneously disengaging said lock and detents from the indicating devices, substantially as described.

10. The combination with indicating and registering devices and operating arms therefor, of a shutter normally obstructing the view of the indicating devices so as to conceal the indication, means disconnected from and operated independently of the operating arms for operating the shutter to disclose the indication, a lock for engaging and locking said indicating devices, connections between the shutter mechanism and said lock for throwing and holding the latter in engagement with the indicating devices, a lock for retaining the latter in exposing position, detents for engaging and preventing return movement of the indicating devices, and means engaging said shutter lock and detents for simultaneously releasing said shutter and indicating devices, substantially as described.

11. The combination with indicating and registering devices and operating arms therefor, of a shutter normally obstructing the view of the indicating devices so as to conceal

the indication, means disconnected from and operated independently of the operating arms for operating the shutter to disclose the indication, a lock for engaging and locking said indicating devices, connections between the shutter mechanism and said lock for throwing and holding the latter in engagement with the indicating devices, a lock for retaining the shutter in exposing position, dentents for engaging and preventing return movement of the indicating devices, means engaging said shutter lock and detents for simultaneously releasing said shutter and indicating devices, and spring mechanism for returning said shutter and indicating devices to normal position when released, substantially as described.

12. The combination with indicating devices and operating arms therefor, of a shutter normally obstructing the view of the indicating devices so as to conceal the indication, a push rod disconnected from and operated independently of said operating arms for operating the shutter to expose the indication, a longitudinally movable locking bolt for retaining the shutter in exposing position, and a second push rod engaging said locking bolt for withdrawing it from engagement with the shutter so as to release the latter, substantially as decsribed.

13. The combination with indicating and registering devices and operating arms therefor movable varying distances, a lock for engaging said indicating devices, a depressible apron in proximity to the path of movement of said arms and adapted to be depressed by the hand of the operator in operating said arms, and connections between said apron and lock for throwing the latter into engagement with the indicating devices to arrest the movement of the latter, substantially as described.

14. The combination with indicating and registering devices and operating arms therefor movable varying distances, a lock for engaging said indicating devices, a depressible apron in proximity to the path of movement of said arms and adapted to be depressed by the hand of the operator in operating said arms, connections between said apron and lock for throwing the latter into engagement with the indicating devices to arrest the movement of the latter, and a spring for sustaining the apron in elevated position, substantially as described.

Change claim 11 to claim 15.

With this amendment are filed the affidavits of applicant

and Charles O. Fuller and three photographs and a drawing of a machine built by applicant prior to March 18, 1890, showing the completion of the invention by applicant prior to the date of filing of the application for the Maskelyne patent.

The machine represented by these photographs and the drawing contains the subject matter of each of the claims rejected upon this Maskeleyne patent, and it is submitted that these affidavits are sufficient to overcome the Maskelyne patent as a reference and that the claims presented should therefore be allowed.

We have thought it best to amend some of these claims so as to put them in more satisfactory form, and have, for convenience, rewritten them.

Respectfully,

F. L. FULLER

By PHILLIP MUNSON & PHELPS

Attys.

(Here follow three photographs and a drawing all omitted by stipulation.)

City County and State of New York, } ss:—

Frederick L. Fuller, being duly sworn deposes and says: That he is the applicant who filed the application Serial Number 380,411, February 6th, 1891, for Cash Register. That he verily believes himself to be the original first and sole inventor of the improvements described and claimed in the foregoing amendment in addition to that which was embraced in the claims originally made and that he does not know and does not believe that the same was ever before known or used and that the matter sought to be inserted formed a part of his original invention at the date of filing his said application and was invented by him before he filed the same.

Deponent further says that prior to the 18th day of March, 1890 he completed the invention covered by each of the claims now standing in said application including the claims inserted by the accompanying amendment. That prior to said 18th day of March, 1890, he made a full sized operative machine embodying the said invention. That the three photographs marked Figures 1, 2 and 3 and the drawing marked Figure 4 hereto annexed correctly illustrate the construction of the said machine; said photographs being taken from said machine. The reason a photograph is not presented illustrating what is shown in the drawing Figure 4 is because it would be impossible unless the machine were practically dismantled to obtain a photograph of the parts shown in said Figure 4. In the said photographs and drawing the same reference letters are employed to illustrate corresponding parts shown and described in his aforesaid application. In said photographs and drawing, as in the drawings accompanying the aforesaid application, 23 represents a shutter loosely journaled on a shaft in the upper portion of the register casing and provided with a tooth 39 engaged by a recess 40 in the upper end of a lever 41, the lower end of which is engaged by a push rod 43 mounted so as to slide in the right hand side frame of the machine. Extending transversely across the machine casing at its rear is a locking bolt 44 spring pressed by means of a spring 45 to the right which, as this shutter lever is moved backward by the push rod 43 is adapted to enter a recess in the lower end of the lever and to engage and lock the same against return movement, as in said application. When the shutter lever is rocked

as just described it will, through the engagement of its recess 40 with the tooth 39 rock the shutter 23 upwardly so as to expose the indication. On the other or left hand side of the machine is provided a second push rod 33, the inner end of which is provided with a tapered portion 34 adapted to engage a pin 35 on the end of the locking bolt 44. As the push rod 33 is moved inwardly, this tapered portion 34 engaging the pin 35 will withdraw the locking bolt 44 from the recess in the lower end of the shutter lever 41, thus releasing the latter which is then returned to normal position by means of a spring (not shown) or by gravity. As the shutter lever is thus returned to normal position it will also through the recess 40 and tooth 39 return the shutter 23 to normal position so as to conceal the indicators. The push rods 33, 43 are each provided with a spring 56, 59 respectively for returning them to normal position after each operation. The machine is also provided with a locking plate 49 adapted to engage the indicating devices, namely, the intermediates 66, for the purpose of locking the indicating and registering devices against movement. This locking plate 49 is provided with arms 50 fulcrummed in the fachine frame one of which is adapted to be engaged by a pin 52 upon the upper end of the shutter lever 41 when the latter is operated by the push rod 43 to operate the shutter to disclose the indication. When the arm 50 is so engaged by the pin 52 the arms 50 and plate 49 will be rocked downwardly, the latter engaging the teeth of the intermediates 66 and thus arresting further movement of the indicating and registering devices until the shutter lever is released by means of the push rod 33, as before described. Upon the release of the shutter lever 41, as before described, the arms 50 and locking plate 49 are rocked upwardly out of engagement with the intermediates 66 by means of a spring 51 attached to the lower end of a lever 50a which is connected to the arms 50. The locking plate 49 is also adapted to be depressed into locking position upon the completion of the movement of the indicating devices to indicating position by means of an apron 53 arranged in the path of movement of and adapted to be depressed by the hand of the operator, which is provided with a rearwardly extending arm 54 engaging a pin on the lower end of the lever 50,. The machine is also provided with detents 57 adapted to engage the segments 3 of the operating arms to lock the same against retrograde movement; said detents being released so as to

permit the return of the operating arms to normal position by means of the push rod 35 engaging a spring pressed arm 57_a. When the detents 57 are thus disengaged from the segments 3 the later and all the indicating devices are returned to normal position by means of springs 29.

As before stated the said photographs and drawing correctly represent the construction of said machine so made by me prior to March 18th, 1890 and such machine was prior to that date shown and described by me to my brother Charles O. Fuller.

FREDERICK L. FULLER.

Subscribed and sworn to before me this 18th day of June, 1896.

ARTHUR L. KENT
Notary Public Kings Co.

Ctf filed N. Y. Co.

State of New Jersey } ss:—
County of Mercer }

CHARLES O. FULLER, being duly sworn, deposes and says:—

I am a brother of Frederick L. Fuller, who filed an application February 6, 1891, No. 380,411 for Cash Register, and I am familiar with the construction shown and described in said application and with the method of operation of the same.

I have been familiar for several years last past with the construction of cash registers and have also been familiar for several years past with the inventions made by my said brother in that art; he having explained to me at various times for several years last past the different inventions made by him in cash registers.

Among the cash registers invented by my said brother and shown and described to me by him was one which he showed and described to me fully prior to March 18, 1890. In this machine indicating devices were employed which were operated by means of segments and operating arms, and in which also was employed a shutter which normally concealed the indicators from inspection. This shutter was mounted so as to rock upon the shaft supporting the indicator wheels and

was adapted to be engaged and operated so as to disclose the indication by means of a shutter lever fulcrummed in the machine casing, the lower end of which was adapted to be engaged and rocked rearwardly by a push rod upon the right hand side of the machine. In the rear of the machine was also employed a transversely moving locking bolt spring pressed into locking position and which, as the shutter lever was moved rearwardly by the push rod, was adapted to enter a recess in the lower end of the shutter lever and to thus lock it against return movement. The release of the shutter lever was effected in this machine by means of a second push rod upon the left hand side of the machine, the inner end of which was tapered and engaged a pin secured to the locking bolt so as to withdraw the latter out of the recess in the lower end of the shutter lever and thus permit the latter to return to normal position, such return being effected by means of a spring or by gravity. In this machine, also, was employed a locking plate adapted to be engaged and depressed into engagement with the indicating devices so as to lock the latter against movement by means of a pin carried by the shutter lever which engaged said plate when moved to position to operate the shutter to disclose the indication. This locking plate was retained in locking position until the shutter lever was released as before described. As soon as the release of the shutter lever was effected, the locking plate was returned to normal position out of engagement with the indicating devices by means of a spring. In this machine, also, detents were employed engaging the operating segments so as to prevent retrograde movement of the indicating devices. These detents were adapted to be withdrawn from engagement with the operating segments upon the operation of the left hand push rod. As soon as the detents were thus disengaged the segments and indicating devices were all returned to normal position by means of springs. The locking plate, before referred to, in this machine was also adapted to be actuated from an apron arranged in line with the path of movement of the hand of the operator, which apron was provided with a rearwardly extending arm engaging a pin upon a lever connected to said locking plate; so that upon the completion of the desired movement to make an indication the locking plate was thrown into engagement with the indicating devices through the apron so as to temporarily lock said indicating devices and also the register-

ing mechanism for the purpose of preventing overthrowing of the registering and indicating devices.

I have examined three photographs and a drawing annexed to the affidavit of my said brother dated June 18, 1896, and I recognize in said photographs and drawing the machine shown and explained to me by my said brother prior to March 18, 1890. I may further state that I assisted my brother in making this machine, and that the same was completed before he explained the same to me prior to March 18, 1890.

In said photographs and drawing, 23 represents what I have heretofore referred to as the shutter, 41 the shutter lever which is provided with a recess 40 receiving a projection 39 on the shutter; 43 is the right hand push rod which engaged the shutter lever, 44 the locking bolt which locked the shutter lever, 45 a spring for normally holding said bolt in locking position; 33 the left hand push rod for operating the locking bolt to release the shutter, 49 the locking plate for locking the indicating and registering devices, 52 the pin carried by the shutter lever for operating said locking plate, 51 the spring for returning said locking plate to normal position, 53 the apron provided with an arm 54 engaging a pin on an arm 50ª connected to said locking plate 49. 57 represent the detents engaging the actuating segments and 57ª the arm or lever adapted to be engaged by the left hand push rod 33 so as to disengage the detents from said actuating segments, and 29 represent the springs for returning the actuating segments and indicating devices to normal position.

CHAS. O. FULLER.

Subscribed and sworn to before me this 19th day of June, 1896.

GEORGE W. MACPHERSON
(Notarial Seal). *Notary Public of New Jersey.*

(Endorsed) Serial No. 380,411 Paper No. 14 Amdt D. Filed June 22 1896 F. L. Fuller United States Jun 22 1896 Patent Office. Div 23. Jun 22 1896 U. S. Patent Office.

2—260.

Div. ..... Room 217 Paper No. .....

All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

All communications respecting this application should give the serial number, date of filing, and title of invention.

J. P. H.

DEPARTMENT OF THE INTERIOR,

United States Patent Office,

Washington, D. C., Aug. 24, 1896

Mailed " " "

Frederick L. Fuller,
Care Philipp, Munson & Phelps,
Temple Court, New York, N. Y.

Please find below a communication from the Examiner in charge of your application, for Cash Indicators, filed Feb. 6, 1891, serial number 380,411.

JOHN S. SEYMOUR
Commissioner of Patents.

In Fig. 1, the gear wheel "5" is marked "66".

In figure 3 it is suggested that numerals "6", "11" and "12" be placed alongside the drawing and connected with the part to which it refers by line x.

Claims 1, 2 and 3 are rejected as substantially met by patent to Pottin, #312,014, Feb. 10, 1885, Cash Registers, Rotating Indicators.

Claims 4 to 15 both inclusive as at present advised are allowed.

WM. J. RICH,
Acting Examr

C. W. S.

(Endorsed) Serial No. 380411 Paper No. 15 Rej. Dated Aug 24 1896

New York, October 12, 1896.

In the matter of the application of
F. L. Fuller, Cash Registers. Filed
February 6, 1891, No. 380,411.
(Room 266)

Hon. Commissioner of Patents,
Washington, D. C.

Sir:—

I hereby amend as follows:—

Claim 1, line 2, before "shutter" insert—"pivoted"

Claim 2, line 2, before "shutter" insert:—"pivoted"

Claim 3, line 2, before "shutter" insert "pivoted"

Although claims 1 to 3 as presented by our last amendment clearly distinguish in patentable particulars from the Pottin patent cited by the Examiner, we have, in order to avoid delay in the prosecution of this application, further amended each of these claims, so as to bring out more clearly still another distinguishing characteristic of applicant's construction over that of Pottin's. As now presented, it is respectfully submitted that these claims should be allowed.

With reference to the error in the lettering of Figure 1 to which the Examiner calls attention, our blue print copy of the drawings on file do not disclose it. It may, however, exist, and if, upon inspection of the drawing on file, we find this to be the case, we will make the correction.

As to the Examiner's suggestion with reference to the application of certain numerals to Figure 3, we do not quite understand his suggestion; otherwise, we would be pleased to adopt it.

Respectfully

F. L. Fuller,
by Philipp Munson & Phelps
Attys.

(Endorsed) Serial No. 380,411 Paper No. 16. Amendment Filed Oct. 28" 1896 F. L. Fuller United States Oct 28 1896 Patent Office. Div. 23 Oct 28 1896 U. S. Patent Office.

Serial No. 380411

Issue Division.
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

DEPARTMENT OF THE INTERIOR,
United States Patent Office,
Washington, D. C., Dec. 23, 1896.

Frederick Lincoln Fuller
C/o Philipp, Munson & Phelps
Temple Court
New York N. Y.

Sir:

Your Application for a patent for an Improvement In Cash Indicators filed Feb. 6, 1891, has been examined and Allowed.

The final fee, Twenty Dollars, must be paid, and the Letters Patent bear date as of a day not later than Six Months from the time of this present notice of allowance.

If the final fee is not paid within that period the patent will be withheld, and your only relief will be by a renewal of the application, with additional fees, under the provisions of Section 4897, Revised Statutes. The office aims to deliver patents upon the day of their date, and on which their term begins to run; but to do this properly applicants will be expected to pay their final fees at least Twenty Days prior to the conclusion of the six months allowed them by law. The printing, photolithographing, and engrossing of the several patent parts, preparatory to final signing and sealing, will consume the intervening time, and such work will not be done until after payment of the necessary fees.

When you send the final fee you will also send, Distinctly And Plainly Written, the name of the Inventor and Title Of Invention As Above Given, Date Of Allowance (which is the date of this circular), Date of Filing, and, if assigned, the Names Of The Assignees.

If you desire to have the patent issue to Assignees, an assignment containing a Request to that effect, together with the Fee for recording the same, must be filed in this office on or before the date of payment of final fee.

Additional copies of Specifications and Drawings will be

charged for at the following rates: Single Copies, uncertified, 10 cents each. The money should accompany the order.

Very respectfully,

JOHN S. SEYMOUR
Commissioner of Patents.

After allowance, and prior to payment of the final fee, applicants should carefully scrutinize the description to see that their statements and language are correct, as mistakes not incurred through the fault of the office, and not affording legal grounds for reissues, will not be corrected after the delivery of the letters patent to the patentee or his agent.

(Printed in red across page above) ☞In remitting the final fee give the serial number at the head of this notice.

(Stamped on left-hand margin) The within title is that given by the Examiner in charge, as most appropriate to your invention. Should you desire a change in the same, satisfactory reasons Must be given therefor on or before the payment of the final fee.

Fred L. Fuller,
Trenton, N. J.
Amount Received
$60
Chief Clerk.
336 Hamilton Ave.

Wednesday, June 9th-1897

Hon. Commissioner of Patents
Washington, D. C.

Dear Sir,

Find enclosed $60, the final Government fee, in the following applications, for Cash Registers, which are to issue to myself—

Serial No. 380411 Filed Feby 6, "91.
447781 " October 4 "92.
463366 " Feby 23 "93.

Yours truly
FREDERICK L FULLER.

(Endorsed) U. S. Patent Office Jun 10 1897 Chief Clerk.

2—183.

Serial No. 380411

Issue and Gazette Division.
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

DEPARTMENT OF THE INTERIOR,

United States Patent Office,

Washington, D. C., June 10, 1897.

F. L. Fuller
336 Hamilton Ave
Trenton N. J.

Sir:

Your application for a patent for an Improvement In Cash Indicators filed Feb. 6, 1891, has been examined and again Allowed.

The final fee, Twenty Dollars, in the above-entitled case was received June 10, 1897.

Very respectfully,

BENJ. BUTTERWORTH
Commissioner of Patents.

To the Commissioner of Patents.

The undersigned having on or about Sept. 29, '93 appointed Philipp Munson and Phelps, of New York, in the county of New York and state of New York, his Attorneys to prosecute an application for letters patent, which application was filed Feby. 6-1891, Serial No. 380,411, for an improvement in Cash Indicators, hereby revokes the power of Attorney then given.

Signed at Trenton, in the county of Mercer, and state of N. J., this 12th day of June 1897.

FREDERICK L. FULLER

Witness
W HOLT AFGAR
132 East State St.
Trenton N. J.

(Endorsed) Serial No. 380411 Paper No. 17 Rev of Power of Atty Filed June 17 1897. U. S. Patent Jun 17 1897 Office

2—327.

Amount Received
$20
Chief Clerk.

Memorandum
of
Fee Paid At United States Patent Office.

(Be careful to give correct Serial No.)

Serial No. 380,411, 1891.
Inventor: Frederick L. Fuller
Patent to be issued to .....
Name of invention, as allowed: Cash Indicator
Date of payment: June 23, 1897
Fee: Final $20.00
Date of filing: Feb. 6/91
Date of circular of allowance: .....

The Commissioner of Patents will please apply the accompanying fee as indicated above.

PHILIPP, PHELPS & SAWYER
Attorney.

Send patent to Attorneys.

(Endorsed) U. S. Patent Office Jun 23 1897 Chief Clerk. $20 Remitted Jun 26 1897 Financial Clerk. F. D. M.

(Serial Number 380411) 1891. (Ex'r's Book,) 156

13971

Patent No. 585467

Frederick Lincoln Fuller.

Of Waterbury.

County of

State of Connecticut.

Invention Cash Indicators

Parts of Application filed.

Petition	Feby. 6, 1891.
Affidavit	" " "
Specification	" " "
Drawing 3 shts,	" " "
Model	Not Required
Specimen	
First fee Cash 1	$15, Feby. 6/91
" " Cert.	

2 App. filed complete Feb. 6 —91

Examined Dec. 22 '96 J. T. Newton Ex

Countersigned: J W Babson

For Commissioner.

Notice of allowance December 23, 1896.

Final fee Cash $20, June 10, 1897.

Cash

3 " " *(*Cert.*) $20 June 23, 1897.

Patented June 29, 1897.

*(*Francis C Lowthrop*)

(*S. H. Hubbard*) (*Trenton N. J.*)

$20 refunded June 25-97 Philipp, Phelps & Sawyer

(*Bridgeport*)

(*Goldsborough*)

(Printed in right-hand margin) June 10, 1897

*Matter in italics in parentheses, stricken out in original transcript.

Cash Registers,
Rotating Indicators.
1891.

Contents:

Application paper*(s).

1. Mar. 6/91, Asso. Power of Atty
2. May 9, '1 Rejection.
3. June 15/92 Withdrawal of Asso. Atty.
4. Power of Atty May 6-93.
5. Amdt. May 9-93.
6. May 19, '93. Letter.
7. Rev & Power of Atty Oct. 2 '93.
8. Notice of Rev & Acceptance,
9. of Power of Atty Oct. 4 '93
10. Amdt B, May 18/95.
11. June 3, 1895, Rejection.
12. Amdt C, Dec. 3/95
13. Jan. 6 1896, Rejection.
14. Amdt. D. June 22/96
15. Rejection August 24, 1896.
16. Amendt Oct. 28/96
17. Rev of Power of Atty June 17 '97
18.
19.
20.
21.
22.
23.

Title: Improvement in Cash Indicators.

98465/06 F. B. C. A. S. M. U. S. Patent Office, Copy made May 29, 1905.

(Endorsed) Filed Jun 13 1912 at ..... o'clock ..... M. T. C. MacMillan Clerk.

*Matter in italics in parentheses, stricken out in original transcript.

ne 13.

U. S. DIST. CT.

N. Dist. Ills.

Eastern Div.

The Computing Scale Co.

vs.

Toledo Computing Scale Co.

In Equity 30,024

DEFT'S EXHIBIT FILE WRAPPER PATENT IN SUIT NO. 597300

KATE S. HOLMES
Notary Public & Examiner

2—390.

UNITED STATES OF AMERICA,

DEPARTMENT OF THE INTERIOR,

United States Patent Office.

To all to whom these presents shall come, Greeting:

This It To Certify that the annexed is a true copy from the Records of this Office of the File Wrapper, Contents, and Drawings, in the matter of the Letters Patent of Albert U. Smith, Assignor to The E. C. Smith Company, Number 597,-300, Granted January 11, 1898, for Improvement in Price-Scales.

In Testimony Whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the City of Washington, this 10th day of November, in the year of our Lord one thousand nine hundred and eleven and of the Independence of the United States of America the one hundred and thirty-sixth.

F A TENNANT
Assistant Commissioner of Patents.

(Seal)

(Serial Number,) 646491

Div. Div. XXIII (Ex'r's Book,)

1897. 83

878

Patent No. 597300
Albert U Smith
Assor. to The E. C. Smith
Company of same place.
(corp. of Conn.)
Of Saugatuck
County of
State of Connecticut
Invention Scales

Parts of application filed.

Petition	July 30, 1897.
Affidavit	" " "
Specification	" " "
Drawing 2 shts	" " "
Model none required.	
Specimen	
First fee Cash $15,	July 30, '97.
" " Cert.	
1	

App. filed complete July 30, '97.
2
Examined Dec. 9 '95 J. T. Newton. Ex.
Countersigned. J. W. Babson
For Commissioner.

Notice of allowance December 11, 1897.
Final fee Cash $20 Dec 23, 1897.
" " Cert. , 189
Patented January 11, 1898
Assoc.
A. W. Harrison A. M. Wooster
3 City Bridgeport
Conn.

Amount Received
$15—
Ck Chief Clerk

PETITION.

To the Commissioner of Patents:

The petition of Albert U. Smith a citizen of the United States, residing at Saugatuck in the County of Fairfield, State of Connecticut, prays that Letters Patent may be granted to him for improvements in Scales, as set forth in the annexed specification.

And he hereby appoints A. M. Wooster, of Bridgeport, Connecticut, his attorney, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein to sign the drawings, to receive the Patent, and to transact all business in the Patent Office connected therewith.

Signed at Saugatuck, in the County of Fairfield and State of Connecticut, this 28th day of July, 1897.

ALBERT U. SMITH.

SPECIFICATION.

To all whom it may concern:

Be it known, That I Albert U. Smith, a citizen of the United States, residing at Saugatuck, in the County of Fairfield, and State of Connecticut, have invented certain new and useful improvements in Price Scales and I do hereby declare the following to be a full, clear and exact description of the invention, such as will enable others skilled in the art to which it appertains, to make and use the same.

My present invention relates to an improvement upon the type of scales which automatically compute and indicate both the weight of the merchandise that may be placed in the weighing pan and the amount to be charged therefor, my improvement being a carrying forward of the principles of operation illustrated and described in my former letters patent reissued April 28, 1896, No. 11,526. As scales of this class have heretofore been constructed in order to enable the purchaser to read the figures upon the drum which indicate the weight of the merchandise in the weighing pan it has been necessary for him to stand upon the same side of the scale as the dealer which is of course inconvenient as for example if the scale is used over a counter or table, or else it has been necessary to turn the scale half way round to enable the purchaser to

read the figures. The object of my present invention therefore is to combine with scales of the type referred to certain improvements which will cause the weight of the merchandise in the weighing pan to be indicated by both sides of the drum and to appear simultaneously on opposite sides of the scale, and furthermore to combine with scales of this type certain improvements in the details of construction which will compensate for any uneven stretching of the springs and will render cramping of the parts in use practically impossible, and furthermore to combine with scales of this type certain improvements in the details of construction which will limit the upward movement of the draft and rack bars and thereby stop backward rotation of the drum, but without imparting any appreciable shock to the drum.

With these ends in view my present invention consists in the construction and combination of parts as hereinafter fully described and then specifically pointed out in the claims.

In the accompanying drawings forming part of this specification.

Fig. 1 is a front elevation of my novel scale.

Fig. 2 a rear elevation of the casing detached.

Fig 3 an end elevation as seen from the left in Fig. 1.

Fig. 4 an elevation of the drum detached, and

Fig. 5 is a section on the line x-x in Fig. 1.

1 denotes the casing which is secured in a suitable frame A comprising in the present instance uprights 2, connected by a top cross bar 3 and a bottom cross bar 4. 5 denotes brackets at the upper ends of the uprights and 6 brackets at the lower ends of the uprights, said brackets 6 being provided with slots 7 through which the draft bars 8 and the rack bars 9 pass freely. The draft bars are connected to draft springs 10, the upper ends of said springs being connected to brackets 5, and the upper ends of the rack bars are provided with or connected to racks 11 which engage pinions 12 upon a drum 14 which in the present instance is shown as carried by a shaft 13 which is journaled in the uprights. The lower ends of the draft rods are pivoted to an evener 15 at the center of which is rigidly secured a hook 16 to which the weighing pan, not shown, may be attached. 17 denotes an eye carried centrally by the evener through which a spring cross rod 18 passes loosely. In the present instance I have shown the eye and the hook as made integral. It is not material however, so far as the spirit of my invention is concerned whether the

hook and eye are made in one piece or not. The ends of the spring cross rod pass through sleeves 19 at the lower ends of the rack bars and are provided at their extreme ends with slots 20 which receive the edges of the draft bars. 21 denotes collars on the spring cross rod which are held in position thereon by set screws and serve to retain the parts in operative position. It will be noted, see Fig. 5, that the spring cross rod is loose enough in the eye to permit free movement of the rod. The object of this construction is to permit uneven stretching of the springs without in any way affecting the accuracy of the scales. In setting up the scales all the springs are the same length but in use they frequently stretch unevenly. In my present construction it is a matter of no consequence whether the evener is parallel with the spring cross rod or not. When the weight is applied if one spring stretches more than the other and if the evener is tilted to a plane out of parallel with the spring cross rod, the pull upon the spring cross rod exerted by the contents of the weighing pan will still be central consequently there will be no side movement or cramping of any of the parts and the accuracy of the scale will be in no way affected by the uneven stretching of the springs.

In order to limit the upward movement of the draft and rack bars and stop the backward rotation of the drum when merchandise that has been weighed is removed from the weighing pan I provide stop pins 22 on the draft-bars which are adapted to engage some fixed portion of the scale, in the present instance brackets 6, to limit the upward movement of the draft bars and consequently of the evener, spring cross rod and rack bars and thereby stop the backward rotation of the drum. Owing to the fact however, that cross rod 18 is resilient and acts as a spring when the upward movement of the draft rods is stopped by the engagement of the stop pins with brackets 6, the upward movement of the rack bars is not checked instantly and the backward rotation of the drum is stopped yieldingly thus preventing any appreciable shock or strain upon the frame of the drum.

The drum is preferably of the character described and claimed in my said reissued Letters Patent referred to. But without regard to the construction of the drum itself there is this important difference in the columns of figures thereon. Instead of one column of figures to indicate pounds and ounces I provide the surface of the drum with two columns of figures to indicate pounds and ounces, said columns reading in

opposite directions as clearly shown in Fig. 4, one of said columns being indicated by *a* and the other by *b*. These columns may be side by side or separate as preferred, and may be at the center or either end of the drum as preferred. The object in providing two columns of pound and ounce figures running in opposite directions is to enable a purchaser to read the weight of the article in the weighing pan from the back of the scale. This I accomplish by providing an opening 23 in the back of the casing, see Fig. 2, through which one column of figures may be read, in this instance, column *a*, and by providing an opening 24 in the front of the casing and out of line with opening 23 through which the other column of figures in the present instance column *b*, may be read. Another important difference is that instead of repeating the figures denoting pounds and adding ounces at each repetition, I use relatively large figures, not repeated, to represent pounds and relatively small figures as 4, 8, 12 to indicate the number of ounces in addition to the number of pounds. *c* denotes columns of figures parallel with columns *a* and *b* and arranged in alignment therewith which indicate the amount of money to be charged for the merchandise that is being weighed. 25 denotes the usual opening across the front of the casing through which the figures indicating the amount of money to be paid for the merchandise that has been weighed are visible, opening 25 preferably intersecting with opening 24 as shown in Fig. 1. Below opening 25 I provide upon the casing a line of figures designated by *d* which indicates (in the present instance from five to thirty) the number of cents per pound to be charged for the merchandise that is being weighed, the operation being as follows: If nine is the number of pounds indicated at openings 23 and 24 and the price per pound to be charged for the merchandise is eight cents, the user will find seventy-two indicated in opening 25 just above the figure 8, belonging to the line of figures which I have indicated by *d*. *e* is a line of figures above opening 25 which indicates in dollars and cents the amount to be charged for a predetermined number of pounds of merchandise for example twenty pounds as shown in the drawing, at any special price per pound, in the present instance from five to thirty cents per pound. As the number of pounds indicated on the drum in the present instance is twenty and as it is frequently desirable to weigh merchandise running up to more than twenty pounds in weight it is obvious that after the numerals indicating from one to twenty pounds upon the drum have

passed the zero mark one, two, three pounds and so on will be again indicated at opening 24. To ascertain the amount to be charged for any number of pounds within the capacity of the scale and above twenty the user adds to the amount indicated in opening 25 the corresponding amount indicated in line *e* immediately above the amount in column *c* on the drum which appears at opening 25 immediately above the numeral in line *d* which indicates the price per pound. Openings 23, 24 and 25 in the casing are in practice covered with glass. 26 denotes characters to denote the zero point, in the present instance †pointers or ^ arrows which are placed upon the glass over openings 23 and 24 at the proper point to register with zero in columns *a* and *b* respectively.

Nov. 27/97

Having thus described my invention, I claim:

---

*(*1. In a scale of the character described the combination with a casing having openings 23 and 24 in opposite sides thereof, of a drum adapted to rotate* †independent *in said casing and provided with two ^ columns of figures to indicate pounds and ounces, said columns of figures reading in opposite directions and being visible at openings 23 and 24 respectively,*

Oct. 28/97

Insert C

Oct. 28/97 ^ C

2. *In a scale of the character described the combination with a casing having openings 23, 24 and 25, of a drum adapted to rotate within the casing and provided with columns of figures to indicate amounts of money which are adapted to register with* †independent *opening 25 and with two ^ columns of figures to indicate pounds and ounces said two colums of figures reading in opposite directions and one of said columns being visible at opening 23 and the other at opening 24,*

Sub. D Nov. 27/97 "

Insert C'

Oct. 28/97 ^ C'

3. *In a scale of the character described the combination with a casing having openings 23 and 24 in opposite sides thereof, of a drum adapted to rotate* †independent *within the casing and provided with two ^ columns of figures to indicate pounds and ounces, pounds in*

---

*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

said columns being indicated by relatively large figures and ounces by relativly small figures, said col-
Insert C² *umns of figures reading in opposite directions and being visible at openings 23 and 24 respectively,*
Oct. 28/97 C²

4. In a scale of the character described the combination with a casing having openings 23, 24 and 25 and below opening 25 a line of figures indicating prices per pound for merchandise and above opening 25 a line of figures indicating amounts to be charged for a predetermined number of pounds of merchandise, of a drum adapted to rotate within the casing and provided with columns of figures visible at opening 25 to indicate amounts to be charged for mer-
" *chandise between one pound and the predetermined*
†independent
number of pounds, and with ^ columns of figures
Insert C³ *visible at openings 23 and 24 respectively to indicate pounds and ounces, ^*
Oct. 28/97 C³

5. In a scale of the character described the combination with a casing having openings 23, 24 and 25, and below opening 25 a line of figures indicating prices per pound for merchandise and above opening 25 a line of figures indicating amounts to be charged for twenty pounds of merchandise, of a drum adapted to rotate within the casing and provided with columns of figures to indicate amounts to be charged for merchandise between one and twenty
†independent
pounds and with two ^ columns of figures to indicate pounds and ounces, said two columns of figures read-
Insert C⁴ *ing in opposite directions, one of said columns being visible at opening 23 and the other at opening 24, ^*
Oct. 28/97 C⁴

Canceled Oct. 28/97 *6. The casing having openings 23, 24 and 25 and below opening 25 a line of figures indicating prices per pound for merchandise and above said opening a line of figures indicating amounts to be charged for a predetermined number of pounds of merchandise, substantially as shown for the purpose specified.*

*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

Erase & sub D Nov. 27/97 Insert C⁵

6 7. *The drum having two columns of figures to indicate pounds and ounces, said columns of figures reading in opposite directions substantially as described, for the purpose specified.* C⁵

Oct.28/97. Canceled Oct. 28/97

8. The drum having columns of figures to indicate amounts of money and a column of figures to indicate pounds and ounces, pounds in said column being indicated by relatively large figures and ounces by relatively small figures, substantially as shown, for the purpose specified.)

7 (*9.*) In a scale of the character described the combination with the draft bars and the rack bars, of an evener pivoted to the draft bars and carrying an eye 17 and a cross rod 18 connected to the rack bars and passing loosely through the eye whereby cramping of the parts is prevented should the evener be tilted out of parallel with the cross rod.

8 (*10.*) The combination with the draft bars and the rack bars having sleeves 19, of an evener pivoted to the draft bars and carrying at its center an eye 17 and a cross rod 18 which passes through the sleeves and bears upon the draft bars and the center of which passes loosely through the eye upon the evener so that cramping of the parts will be prevented and the pull upon the rack bars will be even at all times.

9 (*11.*) In a scale of the character described the combination with brackets 6 having slots 7 and the draft bars and rack bars which pass through said slots, of the evener and spring cross rod 18 by which the draft bars and the rack bars are respectively connected, means for connecting said evener and spring cross rod and stop pins 22 in the draft bars which are adapted to engage the brackets to limit the upward movement of the draft bars and rack bars and stop the backward rotation of the drum.

10 (*12.*) In a scale of the character described the combination with a frame, the draft bars having stop pins 22 adapted to engage the frame and the rack bars, of an evener pivoted to the draft bars and a spring cross rod connected to the evener and to the rack bars, said spring cross rod being adapted to yield when the stop pins engage the frame and thereby prevent shock to the drum.

11 (*13.*) The combination with the frame, the drum, the rack bars and the draft bars having stop pins 22, of an

*Matter in italics in parentheses, stricken out in original transcript.

evener pivoted to the draft bars and carrying an eye and a spring cross rod which passes through the eye and is connected to the rack bars, whereby when the upward movement of the draft bars is stopped by the engagement of the stop pins with the frame the backward rotation of the drum is stopped yieldingly.

In Testimony whereof I affix my signature, in presence of two witnesses.

ALBERT U. SMITH

ORLANDO I. ALLEN
HARRY B. SMITH

Oath

State of Connecticut, } ss
County of Fairfield, }

ALBERT U. SMITH the above-named petitioner, a citizen of the United States, and resident of Saugatuck in the County of Fairfield and State of Connecticut, being duly sworn deposes and says that he verily believes himself to be the original, first and sole inventor of the improvements in Scales described in the foregoing specification: that the same has not been patented to him or to others with his knowledge or consent in any country, that the same has not to his knowledge been in public use or on sale in the United States for more than two years prior to this application, and he does not know and does not believe that the same was ever known or used prior to his invention thereof.

ALBERT U. SMITH

Sworn to and subscribed befor me, this 28 day of July, 1897.

RUFUS WAKEMAN,
(Notarial Seal) *Notary Public.*

(Endorsed) Serial No. 646,491 Paper No. 1/2 Application Filed July 30, 1897. Smith U. S. Patent Office Jul 30 1897 Chief Clerk.

2—260

Div. ..... Room No. 221. Paper No. .....

Address only "The Commissioner of Patents, Washington, D. C."

All communications respecting this application should give the serial number, date of filing, and title of invention.

J. H. D.

DEPARTMENT OF THE INTERIOR
United States Patent Office
Washington, D. C., October 12, 1897.
Mailed " " "

Albert U. Smith,
Care A. M. Wooster,
Bridgeport, Conn.

Please find below a communication from the Examiner in charge of your application for Scales, filed July 30, 1897, ser. no. 646,491.

BENJ. BUTTERWORTH
Commissioner of Patents.

Reference numeral "20" referred to in line 28 of page 2, should be marked on the drawing.

Claims 1, 2, 3, and 7 are rejected on English patent #11,536, April 28, 1896 to Smith, Price Scales, taken in connection with patent #438,753, October 21, 1890 to Phelps, Price Scales, on the ground that it is not invention to mark two rows of weight indicating numbers on the drum shown in the patent to Smith, each showing through opposite sides of the casing, in view of the construction shown in the patent to Phelps which provide weight numbers on the casing each being the reverse of the other, so that they may be seen from opposite sides of the machine.

Claims 4 and 5 are rejected on the ground that they cover a mere aggregation of what is shown in patent to Smith and to Phelps, cited above and patent #535,965, March 19, 1895 to Swihart, Price Scales.

Claim 6 is rejected on the patent to Smith, taken in connection with the patent to Swihart, both cited above.

Claim 8 is rejected on the patent to Swihart cited above, see figure 8. The mere difference in arrangement of the

indications shown by application and shown in Figure 8 of the patent to Swihart, is not invention.

J. T. NEWTON
Exr.

C. C. B.

(Endorsed) Serial No. 646491 Paper No. 1 Rej. Dated Oct. 12 1897.

ASSOCIATE POWER OF ATTORNEY.

Application of Albert U. Smith for patent for Scale
Filed July 30, '97 Serial No. 646,491

Hon. Commissioner of Patents:
Sir:

In the matter of the above entitled application Arthur W. Harrison, of Washington, D. C., is hereby appointed associate attorney, with the usual powers.

Respectfully,
A. M. WOOSTER
Attorney of record.

(Endorsed) Serial No. 646,491 Paper No. 2 Assoc. Pow. of Atty. Filed Oct. 27-1897. A. U. Smith Div. 26. Oct 27 1897 U. S. Patent Office.

Albert U. Smith,
Scales,
Filed July 30, 1897,
Ser. No. 646,491,
} Room 221

Hon. Commissioner of Patents,
Sir:

The above entitled application is hereby amended as follows:

Claim 1, line 4, after "two" insert, |—independent—.|

At the end of the claim change the period to a |comma| and thereafter insert, |—and each of said openings being adapted to permit the reading of the figures in one column only.—

C

Claim 2, line 5, after "two" insert, |—independent.|

At the end of the claim change the period to a comma and thereafter insert, |—and each of said openings being

C¹ |adapted to permit the reading of the figures in one column only—.

Claim 3, line 4, after "two" insert, |—independent—.|

At the end of the claim change the period to a |comma| and thereafter insert, |—and each of said openings being

C² |adapted to permit the reading of the figures in one column only—.

Claim 4, line 9, after "with" insert |—independent—.|

At the end of the claim change the period to a |comma| and thereafter insert, |—and each of said openings being

C³ |adapted to permit the reading of the figures in one column only—.

Claim 5, line 8, after "two" insert |—independent—.|

At the end of the claim change the period to a comma and

C⁴ thereafter insert, |—and each of said openings being adapted to permit the reading of the figures in one column only—.|

Claim 7, line 3, after "described" insert |—combined

C⁵ |with a casing having separate openings at front and rear which are at different distances from either end of said casing—.

Cancel claims 6 and 8 and re-number claims 7, 9, 10, 11, 12, 13, as |6, 7, 8, 9, 10,| and |11| respectively.

Reconsideration is respectfully requested.

In connection with claims 1, 2, 3, and 7 it is to be noted that the re-issue patent to Smith cited does not disclose a construction which includes an opening in the casing adapted to exhibit but one column of figures; the opening t' extending from end to end of the casing a. The applicant is not now claiming a mere duplication of the opening t' shown in said re-issue patent, but is claiming a construction which is novel and which results in special advantages clearly set forth in the specification.

Respectfully,

A. W. HARRISON

Associate Attorney.

October 27, 1897.

(Endorsed) Serial No. 646,491. Paper No. 3 Amend't. C. Filed Oct. 28" 1897. A. U. Smith. Div. 23 Oct 28 1897 U. S. Patent Office.

2—260

Div. ..... Room No. 221. Paper No. .....

Address only "The Commissioner of Patents, Washington, D. C." J. H. D.

All communications respecting this application should give the serial number, date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR

United States Patent Office

Washington, D. C., Nov. 10, 1897.

Mailed " " "

Albert U. Smith,
Care A. W. Harrison,
City.

Please find below a communication from the Examiner in charge of your application for Scales, filed July 30, 1897, ser. no. 646,491.

BENJ. BUTTERWORTH
Commissioner of Patents.

Claims 1, 2, 3, 4, 5 and 6 are rejected on patent to Smith of record, taken in connection with patent #312,014 February 10, 1885 to Pottin, Cash Registers, Rotating Indicators, on the ground that it is not invention to provide indicating numerals for the pounds and ounces on the drug of the patent to Smith, as the indicating numerals are placed on the drums shown in the patent to Pottin.

WM. J. RICH
Acting Exam.

C. C. B.

(Endorsed) Serial No. 646491 Paper No. 4 Rej Dated

Nov. 10 1897.
Albert U. Smith,
Scales,
Ser. No. 646,491.
Filed July 30, 1897. } Room 221

Hon. Commissioner of Patents,

Sir:

The above entitled application is hereby amended as follows:

Page 5 of the specification, line 11, before "arrows" insert —pointers or—.

Cancel claims 1 to 6 inclusive and insert:

1. In a scale of the character described, the combination with a casing having openings 23 and 24 in opposite sides thereof, said openings being covered with transparent material having stationary pointers thereon, of a drum adapted to rotate in said casing, ∧ †racks *(ratchets)* and springs substantially as specified for rotating said drum, the said drum being provided with two independent columns of figures to indicate pounds and ounces, said columns of figures reading in opposite directions, and being visible at openings 23 and 24 respectively, and each of said openings being adapted to permit the reading of the figures in one column only, ∧ †the *(end)* pointers on the transparent coverings being so arranged that when one weight is indicated by the pointer at opening 23, the said weight is also indicated by the pointer at †whereby the two indications correspond with each other.

Dec 22/97 Rule 78 D.

Dec 4/97

Dec

2. In a scale of the character described, the combination with a casing having openings in opposite sides but not opposite each other, of a revoluble drum provided with a series of columns of figures representing dollars and cents and two independent columns of figures representing weights in pounds and ounces, one column of the latter being arranged to be read from the same side of the casing as the figures representing dollars and cents, and the other

*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

column of weight figures being arranged to be read solely through the openings in the opposite side of the casing, the figures representing dollars and cents not being visible from said opposite side,

Insert E
Dec 4/97

3. In a scale of the charter described, the combination with the draft bars and the rack bars, of an evener pivoted to the draft bars and carrying an eye 17 and a cross rod 18 connected to the rack bars and passing loosely through the eye, a casing having openings 23 and 24 in opposite sides thereof, a drum having pinions engaging said rack bars and adapted to rotate in said casing and provided with two independent columns of figures to indicate pounds and ounces, said columns of figures reading in opposite directions and being visible at openings 23 and 24 respectively.

4. In a scale of the character described, the combination with the draft bars and the rack bars, of an evener pivoted to the draft bars and carrying an eye 17 and a cross rod 18 connected to the rack bars and passing loosely through the eye, a casing having openings 23, 24 and 25, a drum having pinions engaging said rack bars and adapted to rotate within the casing and provided with columns of figures to indicate amounts of money which are adapted to register with opening 25 and with two independent columns of figures to indicate pounds and ounces, said two columns of figures reading in opposite directions and one of said columns being visible at opening 23 and the other at opening 24.

5. In a scale of the character described, the combination with the draft bars and the rack bars, of an evener pivoted to the draft bars and carrying an eye 17, and a cross rod 18 connected to the rack bars and passing loosely through the eye, a casing having openings 23 and 24 on opposite sides thereof, a drum having pinions engaging the said rack bars and provided with two independent columns of figures to indicate pounds and ounces, pounds in said columns being indicated by relatively large figures and ounces by relatively small figures, said columns of figures reading in opposite directions and being visible at openings 23 and 24 respectively.

6. In a scale of the character described, the combination with the draft bars and the rack bars, of an evener pivoted to the draft bars and carrying an eye 17 and a cross rod 18 connected to the rack bars and passing loosely through the eye, a casing having openings 23 and 24 and 25, and below open-

ing 25 a line of figures indicating prices per pound for pound for purchases, and above opening 25 a line of figures indicating amounts to be charged for a predetermined number of pounds of merchandise, a drum having pinions engaging said rack bars and adapted to rotate within the casing and provided with columns of figures visible at opening 25 to indicate amounts to be charged for merchandise between one pound and the predetermined number of pounds, and with independent columns of figures visible at openings 23 and 24 respectively, to indicate pounds and ounces.

Reconsideration is respectfully requested.

Claims 1 and 2 above presented are believed to clearly point out patentable subject matter.

Claims 3 to 6 above presented combine with features of admitted patentability, certain other features of novelty which go to produce a very desirable scale of the computing type.

An allowance is requested.

Respectfully,

A. W. HARRISON
Associate Attorney.

November 26, 1897.

(Endorsed) Serial No. 646491 Paper No. 5 Amend't. D. Filed Nov. 27 1899 A. U. Smith Div. 23 Nov. 27, 1897 U. S. Patent Office.

2—260

Div. ..... Room No. 221.
Address only
"The Commissioner of Patents,
Washington, D. C."

Paper No. .....
All communications respecting this application should give the serial number, date of filing, and title of invention.

J. H. D.

DEPARTMENT OF THE INTERIOR
United States Patent Office
Washington, D. C., Dec. 2, 1897.
Mailed " " "

Albert U. Smith,
Care A. W. Harrison,
City.

Please find below a communication from the Examiner in

charge of your application for Scales, filed July 30, 1897, ser. no. 646,491.

BENJ. BUTTERWORTH
Commissioner of Patents.

Claims 1 and 2 are rejected on applicant's prior patent of record, taken in connection with patent #312,024, to Pottin, Cash Registers of record for the reasons of record. It is not invention to place transparent material over the reading openings. This is old as shown in patent #589,602 to Hoyt, September 7, 1897.

C. C. B.

Ex.
J. T. NEWTON

(Endorsed) Serial No. 646491 Paper No. 6 Rej. Dated Dec. 2 1897.

Albert M. Smith,
Scales,
Filed July 30, 1897,
Ser. No. 646491.
} Room 221

Hon. Commissioner of Patents,
Sir:

The above entitled application is hereby amended as follows:

Claim 1, line 12, if the word "and" has not been changed to—the—, please make said change.

At the end of the claim change the period to a comma and thereafter insert—whereby the two indications correspond with each other.

Claim 2, at the end thereof change the period to a comma and thereafter insert,—the openings in the opposite sides of the casing being covered with transparent material having stationary pointers thereon adapted to correspond with each other in their indications of figures so that when the pointer on one side indicates one figure in one column, the other pointer on the other side will indicate exactly the same figure in the other column.—

E

Reconsideration is respectfully requested.
During a personal interview today with the Examiner it

was understood that in the absence of a reference showing two colmuns of figures exhibited at opposite sides of a casing, with pointers to indicate corresponding figures in the twc columns, the said claims would be allowed when amended to set forth that feature fully.

Respectfully,

A. W. HARRISON
Associate Attorney.

December 3, 1897.

(Endorsed) Serial No. 646491 Paper No. 7 Amend't E Filed Dec. 4 1897 Albert U. Smith Div. 23. Dec 4 1897 U. S.

Patent Office
Albert M. Smith
Scale
Filed July 30-1897
Ser. #646491
Allowed Dec 11-1897
} Room 221

Hon. Commissioner of Patents,

Sir:

In the matter of the above entitled application, I respectfully request that in line 5 of claim 1, the word "ratchets" be changed to |—racks—.|

The use of the word "ratchets" was a type-writer's error which it is now sought to have corrected. Said word does not appear in the specification.

The correction can be made without withdrawing the case from issue.

Respectfully
A. W. HARRISON
Asso. Atty.

Dec. 22, 1897

(Endorsed) Serial No. 646491 Paper No. 8 Amend't Filed Dec 22 1897 A. M. Smith. Div. 23 Dec 22 1897 U. S. Patent Office. Respectfully, recommended that this amendment be entered, without withdrawing this case from issue, under the provisions of Rdle 78. J. T. Newton Examin. Div 23 Dec. 23 '97. Approved A. P. Greeley Acting Commissioner Dec. 23 '97.

Issue Division.
All communications should be addressed to
"The Commissioner of Patents,
Washington, D. C." Serial No. 646,491

DEPARTMET OF THE INTERIOR
United States Patent Office,
Washington, D. C., December 11, 1897

Albert Smith Assor
C/o A. W. Harrison Assoc
City

Sir:·

Your Application for a patent for an Improvement In Price Scales filed July 30, 1897, has been examined and Allowed.

The final fee, Twenty Dollars, must be paid, and the Letters Patent bear date as of a day not later than Six Months from the time of this present notice of allowance.

If the final fee is not paid within that period the patent will be withheld, and your only relief will be by a renewal of the application, with additional fees, under the provisions of Section 4897, Revised Statutes. The office aims to deliver patents upon the day of their date, and on which their term begins to run; but to do this properly applicants will be expected to pay their final fees at least Twenty Days prior to the conclusion of the six months allowed them by law. The printing, photolithographing, and engrossing of the several patent parts, preparatory to final signing and sealing will consume the intervening time, and such work will not be done until after payment of the necessary fees.

When you send the final fee you will also send, Distinctly And Plainly Written, the name of the Inventor and Title of Invention As Above Given, Date Of Allowance (which is the date of this circular), Date Of Filing, and, if assigned, the NamesOf The Assignees.

If you desire to have the patent issue to Assignees, an assignment containing a Request to that effect, together with the Fee for recording the same, must be filed in this office on or before the date of payment of final fee.

Additional copies of Specifications and Drawings will be charged for at the following rates: Single copies, uncertified, 10 cents each. The money should accompany the order.

Very respectfully,
BENJ. BUTERWORTH
Commissioner of Patents.

After allowance, and prior to payment of the final fee, applicant should carefully scrutinize the description to see that their statements and language are correct, as mistakes not incurred through the fault of the office, and not affording legal grounds for reissues, will not be corrected after the delivery of the leters patent to the patentee or his agent.

(Printed on left-hand margin) ☞In Remitting The Final Fee Give The Serial Number At The Head Of This Notice.

(Stamped on left-hand margin) The within title is that given by the Examiner in charge as most appropriate to your invention. Should you desire a change in the same, satisfactory reasons Must be given therefor on or before the payment of the final fee.

(Stamped on right-hand margin) ☞If payment is made by check or draft, the credit allowed is subject to the collection of the same.

Amount Received
$20—ck
Chief Clerk.

2—327.

Memorandum
of
Fee Paid At United States Patent Office.

(Be careful to give correct Serial No.)

Serial No. 646,491, 18....
Inventor: Albert U Smith
Patent To Be Issued To as per Assgt
Name Of Invention, As Allowed: Price Scales
Date of Payment: Dec 21 '97
Fee: Final
Date Of Filing: July 30 '97
Date Of Circular Of Allowance: Rec 11-97

The Commissioner of Patents will please apply the accompanying fee as indicated above.

A. M. Wooster
Attorney.

Send Pa tent To The E. C. Smith Co. Saugatuck Conn
(Endorsed) U. S. Patent Office, Dec 23 897 Chief Clerk.

(Here follows Letters Patent No. 597,300, a copy of the same heretofore set out in this record and not reproduced here.)

73. Measuring instruments
Price Scales.
1897.

Contents:

1/2 Application / paper.
1. Oct. 12, '97 Rejection.
2. Assoc. Pow. of Atty. Oct 27 '97.
3. Amend't. C. Oct. 28/97.
4. Nov. 10 '97 Rejection.
5. Amend't D. Nov. 27/97.
6. Dec. 2 '97 Rejection.
7. Dec. 4/97 Amend't E.
8. Dec. 22/97 Amend't Rule 78.
9.
10.
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12.
13.
14.
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23.

Title: Improvement in Price Scales.

(Here follow Two sheets of Drawings omitted by stipulation.)

(Endorsed) Filed June 13, 1912, T. C. MacMillan, Clerk.

13.

U. S. DIST. CT.

Northern Dist. Ill.

Eastern Div.

The Computing Scale Co.

v

Toledo Computing Scale Co.

In Equity No. 30024

DEFTS EXHIBIT FILE WRAPPER SMITH PATENT 674883

KATE S. HOLMES
Notary Public & Examiner

2—390.

UNITED STATES OF AMERICA,

DEPARTMENT OF THE INTERIOR,

United States Patent Office.

To all to whom these presents shall come, Greeting:

This Is To Certify that the annexed is a true copy from the Records of this Office of the File Wrapper and Contents in the matter of the Letters Patent of Albert U. Smith, Assignor to The Computing Scale Company, Number 674,883, Granted May 28, 1901, for Improvement in Weight and Price Indicating Scales.

In Testimony Whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the City of Washington, this 13th day of January, in the year of our Lord one thousand nine hundred and twelve and of the Independence of the United States of America the one hundred and thirty-sixth.

F A TENNANT
Assistant Commissioner of Patents.

(Seal)

2—437.

Div. 36

Number (Series of 1900). 1900 Div.....
8021 (Ex'r's Books. 139-16

Patent No. 674883

Name Albert U. Smith
Assignee The Computing Scale Company—
of Dayton, Ohio—
of Saugatuck
County of
State of Connecticuit
Invention Weight & Price Indicating Scales—

Parts of Application Filed.

Original.		Renewed.	
Petition	March 9, 1900		, 190
Affidavit	" ", 1900		, 190
Specification	" ", 1900		, 190
Drawing 6 shts.	" ", 1900		, 190
Model Not Req'd Prints	, 190		, 190
Speciment.....			
1 First Fee Cash $15	Mch. 9, 1900		, 190
" " Cert.	, 190		190
App. filed complete	Mch. 9, 1900		, 190

(Printed in left-hand margin) Division of App., No. , filed , 190

Examined Geo. L. Morton—Exr. Mch. 15 1901 , 190
Countersigned J. W Babson 190
For Commissioner. For Commissioner.

Notice of Allowance	March 18, 1901	, 190
Final Fee Cash $20	May 4, 1901	, 190
2 " " Cert.	, 190	, 190
Patented May 28		, 1901

Associate Attorney Attorney Ira C. Koehne,
Church & Church Dayton,
Address City Address Ohio
Patent No. ..... Date of Patent .....
3 A. U. Smith (8,021)

(Printed in left-hand margin) Church and Church Attys for Assignees.

Div. 36

(Serial Number.) (Ex'r's Book.) Div. 36.

1900

8021 139

16

Patent No. 674,883,
Albert U. Smith
Assor to The Computing Scale Company,
of Dayton Ohio (Corp of Ohio)
Of Saugatuck
County of
State of Connecticut
Invention Weight and Price Indicating Scales.

Parts of Application filed.

Petition	Mar. 9, 1900.
Affidavit	" " "
Specification	" " "
Drawing 6 shts	" " "
Model Not Req'd Prints.	
Specimen	
First Fee Cash $15,	Mar. 9, 1900.
1 " " Cert.	

Appl. filed complete Mch 9—1900
Examined Mar. 15, 1901 Geo. L. Morton Exam
Countersigned:

For Commissioner.

2 Notice of allowance March 18, 1901.
Final Fee Cash , 190 .
" " Cert. , 190 .
3 Patented May 28 , 1901.

Ira C. Koehne
Dayton
Ohio.

Church & Church
City.

(Printed in right-hand margin) (Church & Church Attys for Assignees)

Amount Received
$15.00
Chief Clerk.

PETITION.

To The Commissioner Of Patents:—

Your petitioner, Albert U. Smith, a citizen of the United States, residing at Saugatuck, in the county of Fairfield and State of Connecticut, prays that Letters Patent may be granted him for a new and useful improvement in Weight and Price Indicating Scales, set forth in the annexed specification; and he hereby appoints Ira C. Koehne, (Reg. No. 1503) of the city of Dayton, Ohio, his attorney with full power of substitution and revocation to prosecute this application, to make alterations and amendments therein, to sign the drawings, to receive the patent, and to transact all business in the Patent Office connected therewith.

ALBERT U SMITH
Inventor.

Feb. 6″
1900
25 ICK
U. S.
Revenue Stamp
..... Cents

SPECIFICATION.

To All Whom It May Concern.

Be it known, that I, Albert U. Smith, of Saugatuck, County of Fairfield and State of Connecticut, have invented a certain new and useful improvement in Weight and Price Indicating Scales, and I do hereby declare that the following is a clear, full and exact description thereof, reference being had to the accompanying drawings, in which like letters refer to like parts.

This invention relates to improvements in weight and price indicating scales in general and specifically to that class illustrated in my Letters Patent #545,616 of April 3rd, 1895, reissued #11,536 April 28th, 1896, as well as in my Letters Patent #597,300 January 11th, 1898.

My present invention has for its object the providing of means applicable to all scales employing springs for adjustment of the mechanism or said spring or springs to compensate for the variations in temperature. So far as I am

aware, I am the first in the art to devise, construct and use such means or mechanism, and the broader claims thereon are not to be restricted in their scope to any particular or specific form of apparatus, but to all forms embodying means for adjusting the mechanism or the spring to compensate for the different degrees of temperature however widely they may differ in construction.

In the drawings—

Figure 1 illustrates a front elevation of a scale embodying my invention;

Figure 2 is an enlarged central vertical sectional view of one of the draft bars and indicator controllers;

Figure 3 is an enlarged sectional plan view on line X—X of figure 1;

Figure 4 is a front elevation of the lower portion of the scale shown in figure 1, having added thereto the means for accommodating the mechanism and springs to different degrees of temperature;

Figure 5 is an end view of the parts shown in figure 4;

Figure 6 is an enlarged elevation on line X—X of figure 4;

Figure 7 is a sectional view on line X—X of figure h;

Figure 8 is a sectional view on line X—X or figure 6;

Figure 9 is a diagramatic enlarged front sectional view of the cam and spring bars of the means for accommodating the mechanism to different degrees of temperature;

Figure 10 is a front view of a scale similar to figure 1, but having the end covers of the casing removed and having the front top plate removed to expose the supporting rod at the top of the scale;

Figure 10½ is a top plan view of one end of the scale casing with the controller removed;

Figure 11 is a side elevation of figure 10 with the end controller removed and the front top plate added;

Figure 11½ is an enlarged bottom plan view of the scale suspending means;

Figure 12 is a central vertical sectional detail view of a portion of the spring and its supporting and connecting means;

Figure 13 is a sectional view on line X—X of figure 12;

Figure 14 is an enlarged front elevation of the exposing opening through which only the weight of the load is indicated, the adjacent portion of the casing being broken away;

Figure 15 is a plan view of the indicator drum;

Figure 16 is a sectional detail view of one end of the

spindle of the indicator drum showing the pinion and the manner of securing said pinion to said drum;

Figure 17 is a sectional side elevation in detail of a portion of the end frames and outer casing showing the means for adjustably mounting the glass over the opening that exposes the weights and prices of the loads;

Figure 18 is a side elevation of the parts shown in figure 17 looking from the left;

Figure 19 is an end view of the indicator drum;

Figure 20, 21 and 22 illustrate details of construction thereof;

Figure 23 illustrates a central vertical sectional view through the indicator spindle, the central portion thereof being broken away;

Figure 24 is a reduced sectional side elevation on line X—X of figure 14;

Figure 25 is an enlarged sectional plan view on line X—X of figure 11;

Figure 26 is a front elevation of the glass employed in the indicator shown in figures 24 and 14;

Figure 27 is a sectional view on line Y—Y of figure 11 of the end frame castings; and

Figure 28 is a plan view of the flat sheet which is rolled to form the periphery of the indicator drum.

The general construction and operation of the scale is set forth in the aforesaid Letters Patent, and it is unnecessary to say more about the parts of said scale set forth in the aforesaid Letters Patent than that (10 & 11) indicate the draft bars respectively connected to springs (12 & 13), the lower ends of said draft bars (10 & 11) being connected to the opposite ends of a horizontal bar (14) having a weight receiving hook or member (15) rigidly secured at the center of its length intermediate said draft bars (10 & 11). Parallel with said bar (14) is a supplemental bar (16) preferably bifurcated at its opposite ends to engage said draft bars (10 & 11), said bar (16) being loosely engaged by a projection of said hook or member (15). Pivotally mounted near the ends of the said bar (16) are vertical arms (17) having racks (18) upon their upper ends meshing with pinions (19) secured to the spindle of the indicator cylinder provided with revoluble bearings in projections (20) removably attached to lugs (21) upon each of the cast end frames (22 & 23), Figs. 10, 11 and 27. Said end frames (22 & 23) having their periph-

eries connected to opposite ends of a cylindrical casing (24) provided with a slot (25) in its front face extending substantially the length of the indicating cylinder for exposing the weights and prices of loads, and with a relatively narrow exposing opening (26) in the rear face thereof for exposing to view only the weight of loads suspended from the hook or receiver (15).

I will now proceed to describe the points, constructions and combinations of novelty possessed by my present invention.

The periphery of each of the end frames (22 & 23) adjacent the slot (25) is provided with an arc-shaped recess (30) in which is mounted an arch-shaped strip of glass or other transparent material directly beneath and covering said opening (25). Said glass portion (31) is less in width than the extent of said slots (30) and is secured at a desirable point in said slots (30) by means of substantially U-shaped portions (32), Figs. 11, 17 & 18, and being arc-shaped to embrace said glass portion (31) between its arms, said portion (32) being secured in the instance shown to the inner edge of each of the end frames (22 and 23) by a screw or bolt (33) secured to one part and engaging in a slot (34) in the other part, said bolt (33) and slot (34) being adapted to permit the adjustment of said portions (32) so that said glass portion (31) will occupy different positions in said slots (30), so that the character designating means upon said glass portion (32) may be adjusted to designate the character or characters indicating the true weight or value.

Said character designating means consist, in the instance shown, of a slot (35, Figs. 10, 17 & 18) formed through paper or other opaque material (36) secured to the inner face of the glass portion (31), said slots (35) extending over all the characters indicating the price of articles at different rates per unit while designating line or pointer (37) Figs. 1 & 10, also secured to glass projects over and serves to designate the weight indicating characters exposed through said glass (31). The exposing opening (26) is covered by an arc-shaped glass (38) mounted in an arc-shaped frame (39) with strips (40) of cushioning material interposed between the edges of said glass (38) and said frame (39), Figs. 24 & 26, to prevent the breakage of said glass (38) while said glass is provided with a designating line or pointer (41) adapted to designate the correct weight indicating characters indicated

through said glass (38) and side line or pointer (41) is adapted to be adjusted by the adjustment of the frame (39) in which glass (38) is mounted, said adjustment being by means of screws (42) passing through slots (43) in said frame (39) and into the casing (24) see Figs. 14, 24 & 26.

The end frames (22 & 23) are loosely pivoted at or near their tops upon a rod (44) having collars (45) thereon intermediate said end frames (22 & 23) and the projections (46) passing loosely through the end of said shaft (44) and securing the springs (12 & 13) to said rod (44), so that said frames (22 & 23) are loosely suspended from said rod (44), as are also the springs (12 & 13) from a different point on said rod (44), so that the entire scale casing composed of the end frames (22 & 23) and the cylinder (24) and the parts secured thereto are perfectly free to vibrate upon their suspending rod (44) as a pivot, which vibration is limited by projections (50), Figs. 10 & 25, adjustably mounted upon extensions (51) at the bottom of each of said frames (22 & 23), said projections (51) being each provided with a vertical slot (52) for the accommodation of the draft bars (10 & 11) and the upright bars (17). Projections (50) preferably have pointed ends adjustable toward said draft bars (10 & 11) for the purpose of limiting said vibration of said scale casing (see Figs. 10 & 11 & 25). For the purposes of securing the proper adjustment of the vertical gravity plane of the end frames (22 & 23) and the parts swinging therewith, readily and without undue skill or manipulation, so that said parts can be manufactured in quantities and then be adjusted, so that said vertical gravity plane of said parts will pass through the center of the length as well as of the width of their suspending rod (44), the center of said indicating cylinder and springs (12 & 13), the center of said rods (14 & 15) I provide either or both of said end frames (22 & 23) with a slot or guide (53), Figs. 11 & 27, at an angle to said gravity plane, and in said guide or slot (53) of each of said frames (22 & 23) I adjustably mount a weight (54), the adjustment of which closer to or farther from the said vertical gravity plane correspondingly adjusts said vertical gravity plane until it is in the correct position where the weight of the parts on each side of said vertical gravity plane will be identical and no friction will be caused between the portions (50) and the draft bars (10 & 11) or either of them; and by independently suspending the springs and the casing from the same pivotal point, the objection due to the load upon the springs vibrating

and causing the casing and draft bars to bind in structures where the springs are suspended from the casing is obviated.

The indicating cylinder is formed with a spindle (60) which may be either a thin rod or tube but preferably a tube as shown in Fig. 23, provided with bearings (61) at opposite ends of reduced diameter, and where said spindle (60) is formed of a thin tube, said end bearings (61) are formed of pins driven into the opposite ends of said tube. The pinions (19) are driven onto or otherwise secured to the opposite ends of said spindle (60) and are provided with hubs (62) having flanged end projections (63) fitting against webs (64) provided with slots (65) through which pass screws (66) to confine said webs (64) between the face of said collars (63) and a washer (67), Figs. 16 & 23. Said webs (64) are formed of an equal number of thin, light arms (69) each having a rib (69) extending substantially its length, and said arms (68) are connected at their outer ends to a substantially L-shaped periphery (69A), Figs. 19 & 20. Upon the periphery of and extending between said portions (69A) and rolled into the form of a cylinder is a sheet of paper or other light material (70), which, when absorbent, is preferably coated on both sides with moisture resisting material, Figs. 15, 19, 20 & 28, and provided with a series of rows of characters (71) indicating the prices of loads at different rates per unit, and in the instance shown with two rows (72 & 73) of weight indicating characters, the row (73) extending in the reverse direction to the row (72); and when rolled upon the peripheries of said portions (69A), the rows (72 & 71) of characters are adapted to be indicated through the slot (25) while the row (73) of characters is adapted to be indicated through the slot (26) in the cylindrical casing (24). On one end of said sheet (70) is a strip (74), Fig. 28, in the instance shown provided with no graduations so that the opposite end of said sheet (70) may overlap said strip (74) for the purpose of securing the opposite ends of sheet (70) together to form a cylinder. The zero point or point of beginning for each of the rows (71 & 72) of characters is at the point indicated at (75 in Fig. 28), which is intermediate the oposite ends of said sheet (71) and that said row (73) of characters beginning at a point likewise intermediate the opposite ends of said sheet (71) and that said row (73) of characters beginning at a point likewise intermediate the opposite ends of said sheet (70), which ends are joined together to form a cylinder at a point, in the instance shown, in Fig. 28, 22 pounds removed

from zero with respect to the rows of characters (71 & 72) so that should an inartistic joint be formed between the ends of said sheet (70) it will not be ordinarily exposed through the indicating slots or remain exposed through them as is the case when such joint is formed at the zero position.

To secure said sheet (70) to the peripheries of said portions (69A) I form openings (76) through the peripheries of each of said portions (69A), in the instance shown, one opening on each side of the arms (68) thereof, and through said sheet (70) I form registering openings (77). As shown in Fig. 15, near or at the opposite ends of the cylindrical sheet (70) I wrap a coil of light fine wire (78) so as to bind the cylindrical sheet (70) near their opposite ends to the peripheries of said portions (69A) the opposite ends of said wires (78) overlapping each other as shown at (79) in Fig. 15, and passing through said registering openings (77 & 76) and coiled to the adjacent arms (68) as shown in Figs. 11, 19 and 20. As shown in said figures, the point at which the opposite end of said wires (78) pass through the cylindrical sheet (70) and are wrapped about the adjacent arms (68) are at different points in the arc of the circle so as to distribute the slightly increased weight caused thereby; and to compensate for such increased weight and at the same time to form a means for adjusting the longitudinal center of gravity of said indicator to coincide with its axis of rotation, I adjustably mount upon one or more of the arms (68) weights (80), Figs. 11 & 19 which weights (80) may be adjusted closer to or farther from the center of rotation of said indicating cylinder to change its center of gravity to coincide with said axis of rotation, which adjustment may be made very readily and cheaply and enabling the indicating cylinders and the parts thereof to be made in large quantities with the employment of only ordinary skill and at the same time enabling the adjustment of the center of gravity of said indicator readily by comparatively unskilled persons to coincide with its axis of rotation, to enable it to be revolved upon its axis uniformly and without influencing the counterbalance members or springs (12 & 13).

In the instance shown in the drawings, said weights (80) are formed of bands of soft material surrounding said arms (68) and sliding thereon to correct said center of gravity when said weights (80) are adapted to be pinched or clamped by tweesers or other simple tool so as to firmly bind against said arms (68) and be retained in position.

The uprights (17) pivotally mounted upon opposite ends

of the rod (16) and having the racks (18) secured to the upper ends thereof are provided with weighted arms (81) projecting from said pivotal point at substantially a right angle and in the direction towards, which the teeth of the racks (18) face, see Figs. 10, 11 & 25, so that said weighted arms (81) causing said racks (18) to incline toward and keep at all times in engagement with the pinion (19) and out of engagement with the portion (82), Fig. 11 of projection (20) which extends behind each of said rack bars (18) to prevent said rack bars from moving out of mesh with their pinion (19).

The upper end of each of the end frames (22 & 23) is provided with a lateral extension (100) to each of which projections (100) is removably secured by screws or otherwise the lateral foot (101) of a downwardly projecting open mouthed tube or cylinder (102), Figs. 1, 4, 5 & 10. The vertical axis of said tubes (102) are in the same vertical plane with the counterbalance members or springs (12 & 13), the points of suspension of said springs or members and the scale casing and the point of connection of draft bars (10 & 11) with rod (14) and the point of application of the load to the receiver or hook (15). In each of said tubes (102) is slidingly mounted a piston (103) provided with a circular recess (104) in their lower ends receiving the ball end (105) of connecting rod (106) pivotally and removably connected at their lower ends by cotter pins (107) or otherwise to the opposite ends of the rod (14), which opposite ends of said rod (14) are provided with a slot (108) in which the lower ends of said connections (106) and draft bars (10 & 11) are pivotally mounted.

The upward and downward movement of the bar (14) and its connected parts causes pistons (103) to move correspondingly upward and downward in said tubes or cylinders (102) to respectively compress and rarify the air in said tubes (102) between said pistons (103) and the closed upper end or head of said cylinders (102) for the purpose of controlling and regulating the movement of the bar (14) and its connected parts and steadying the movement of the indicating cylinder in driving connection with said rod (14).

The inner face of each of said projections (100) of the end frames (22 & 23) are provided on opposite sides with lugs (109) adapted to fit into slits (110) formed by L-shaped projections (111) at the opposite ends of the top, front and back plates (112), Figs. 1, 10, 10½ & 11, which plates (112) are for

the purpose of name plates and to give a finished appearance to the scale and concealing the rod (44) from view as shown in Fig. 1.

In the center of the length of said rod (44) is mounted loosely thereon a vertical portion (113) provided on the under side of said rod (44) with projections (114) adapted to loosely engage collars (115) rigidly secured to said rod (44) on opposite sides of said portion (113) and adjacent the ends of the projections (114) for the purpose of enabling the upper end of said portion (113) to have a limited lateral movement between said collars (113) and at the same time prevent any lateral movement of said portion (113) at its point of contact with the bottom of said rod (44) so as to maintain at all times the vertical alignment between the point of contact of portion (113) against the bottom of rod (44) and the point of application of the load to the member or hook (15), and in the same plane with the axis of the tubes or controllers (102) and the springs or counterbalance members (12 & 13). To the upper end of portion (113) and on opposite sides thereof are secured by bolt (116) flexible strips (117) provided throughout their lengths with oppositely located bolt openings (118) for the reception of a bolt (119) to adjustably support said scale to a convenient point of support.

As shown in Figs. 4, 5, 6, 7 & 8, the upper end of said hook or member (15) is provided with a vertical slot (120) in which is mounted to slide vertically a block (121) provided with a horizontal opening (122) therethrough. Said opening (122) being provided with tapering edges (123) for loose contact with the rod (16). Through the top wall of said slot (120) is an opening through which loosely passes a screw (124) rigidly secured to the top of said block (121), on the upper end of which screw (124) is mounted a nut (125) adapted to engage with the upper end of said member or hook (15) to draw said block (121) with its rod (16) farther from or closer to the rod (14) as the case may be for varying the position of the indicator with reference to the counterbalance members or springs (12 & 13) and through a side wall of said slot (120) is passed a screw (126) adapted to engage and clamp said block (121) in its adjusted position in said slot; while a screw (127) passes through said hook or member (15) to clamp the same to the center of said rod (14).

I will now proceed to describe the means I have employed in the instance shown in the drawings for

†variations due to changes in

per A adjusting the mechanism to compensate for ^ *(*the different degrees of*) temperature, reference being had to figs. 4, 5, 6, 7, 8 and 9.

The bar (14) is a long relatively thin spring bar pivotally connected near its opposite ends to the draft bars (10 & 11) and having a load receiver or hook (15) rigidly secured in the center of its length intermediate the points of connection with said draft bars (10 & 11) and loosely connected to the center of the length of the rod (16) on whose opposite ends are pivoted the indicator driving uprights (17), all as aforesaid, and by reason of the sliding engagement between the opposite ends of said bar (16) and the meshing of the racks (18) with pinions (19) rigidly secured to the indicator drum, said rod (16) at all times remains in a perfectly horizontal position at a distance from the center of the length of the bar (14) fixed by the position of the block (121) or by that portion of hook or member (15) which engages with said rod (16). When a load is suspended from the receiver or hook (15) the center of the spring bar (14) yields downward a distance proportionate to the weight of said load, carrying codily downward the horizontal rod (16) a like distance which drives the indicator a proportionate distance; and by reason of the elongation of the springs (12 & 13) in counterbalancing said load said bars (14 & 16) are bodily moved downward a further distance equal or proportionate to the elongation of said springs (12 & 13), and drives said indicator a further proportionate distance, so that, as is apparent from the foregoing, the springs bar (14) transmitting the load to the springs or counterbalancing members (12 & 13) forms a part of said counterbalancing means in the instance shown in the drawings.

When the temperature is cold the springs expand less than when the temperature is warm, and said expansion increases as the temperature increases; and the means I have devised compensate for such variations so that an accurate scale is obtained at any ordinary temperature.

In the instance shown in the drawings said means for compensating for the aforesaid variations consist of one or more bars or members (150) connected at their opposite ends to the opposite ends of the bar (14), the center of said bars (150) passing loosely through a slot (151) in said member

*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

or hook (15) and is adapted to be engaged by a projection or projections (152) upon a shaft (153) provided with bearings in said hook or member (15). On the outer end of said shaft (153) is rigidly secured an indicator disc (154) marked with the different seasons such as Summer, Winter & Temperate, as shown in Figs. 4 & 9 or with the correspondingly different degrees of temperature as may be desired, which different seasons or degrees of temperature are adapted to be designated by a pointer (155) rigidly secured to said hook or member (15).

In the summer or at the highest temperature the cam (152) is adapted to contact with the centers of all the rods (150) to render the connection between the counterbalance members or springs (12 & 13) the most rigid and prevent almost wholly the spring of said rods (150 & 14), and the increased expansion of the springs or members (12 & 13) is compensated for by the reduction or elimination of the flexibility of said connection (rods 150 & 14) between said springs or members (12 & 13). As the temperature changes to temperate said cam (152) is set to render said connection intermediate said springs or members (12 & 13) less rigid. During winter said bars (150) hang loosely from said bar (14) and not engaged by cam (152) which enables said bar (14) to add all its flexibility to the elongation of the springs in order to compensate for the reduced expansion of said springs, to produce accurate results.

In the specific structure shown in the drawings, said rods (150) are two in number arrayed side by side and having their opposite ends mounted in frames (160) secured to the ends of rod (14) by bolts (161) passing through said rods (14) and frames (160) and between said rods (150) while lock-nuts (162) Fig. 6 upon said bolts (161) maintains uniform distances apart the ends of said rods (14 & 150).

In summer or hot weather the periphery of shaft (153) is adapted to contact with the tops of both spring bars (150) so that when an article to be weighed is suspended from hook or member (15) the load will be transmitted by the three spring bars (14 & 150) acting together as one comparatively rigid bar, to the load counterbalancing members or springs; while in temperate weather only one of said spring bars (150) is engaged by the periphery of shaft (153), by reason of the recess (152) therein, so that said bar (12) and one of said bars (150) add their elasticity to that of the counterbalance members or springs in counterbalancing the load; while in win-

ter or cold weather the periphery of shaft (153) does not touch either of the bars (150) by reason of the two recesses (152) registering with and extending into each other, so that the spring bar (14) will add all its elasticity to that of the counterbalancing members of springs in counterbalancing the load; and under each of the aforesaid conditions of temperature the degree of elasticity of the counterbalancing members or springs and said spring bars is equal for a given load, which load is indicated by the indicator driven from the center of the length of said spring bars (14 & 150) as aforesaid so that the uniform elasticity may be communicated to the indicator at the point of greatest advantage, as if the indicator be driven from a point at the end of said rod (14) the elasticity of said rods (14 & 150) will be unavailing. The ends of rods (16) are bifurcated and slide over the draft bars (10 & 11) during the varying elasticities of said rod (14) aided by said spring rods (150) as aforesaid.

It is perfectly obvious that if desired the disc (154) †in the form of a

per A may be ∧ *(*rigidly secured to the hook or receiver (15) and the*) designating hand (155) rigidly secured to and revoluble with the shaft (153) and that numerous other alterations of the construction, form and arrangement of the parts may be made without departure from the scope and spirit of this invention.

Insert B[1]>

Having thus described my invention, what I claim as new and desire to secure by letters patent is:—

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*(*1. In a scale, the combination of the load counterbalancing springs, means for applying load to said springs, a spring bar intermediate said load applying means and said springs, an indicator, means for driving said indicator connected centrally to said* †*independent of the load*

per B *spring bar, and manually adjustable means* ∧ *for* †*degree of flexure*

per A *varying the (flexibility)* ∧ *of said spring bar, substantially as specified.*

2. In a scale, the combination of the load counterbalancing springs, means for applying load to said springs, a spring bar intermediate said load applying means and said springs, an indicator, means for driv-

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*Matter in italics in parentheses, stricken out in original transcript.
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ing said indicator connected centrally to said spring bear and means including a manually adjustable cam
†degree of flexure
Sub F[1] *for varying the* ∧ *(flexibility) of said spring bar,*
per A *substantially as specified.*

3. In a scale, the combination of the load counterbalancing springs, means for applying load to said springs, a spring bar intermediate said load applying means and said springs, an indicator, means for driving said indicator connected centrally to said spring bar, means including a manually adjustable cam for
†degree of flexure
per A *varying the (flexibility)* ∧ *of said spring bar, and an indicator adjustable proportionate to said cam for*
†its proper adjustment at
per A *indicating* ∧ *different temperatures, substantially as specified.*

4. In a scale, the combination of the load counterbalancing springs, means for applying load to said springs, spring bars, an indicator, means for driving said indicator connected centrally to one of said spring bars, and manually adjustable means for vary-
†degree of flexure
per A *ing the (flexibility)* ∧ *of said spring bars for accommodating different temperatures; substantially as specified.*

5. In a scale, the combination of the load counterbalancing springs, means for applying load to said springs, a spring bar, an indicator, means for driving said indicator connected centrally to said spring bar, and a manually adjustable cam for varying the
†degree of flexure
per A *(flexibility)* ∧ *of said spring bar for accommodating different temperatures, substantially as specified.*

6. In a scale, the combination of the load counterbalancing springs, means for applying load to said springs, a spring bar, an indicator, means for driving said indicator connected centrally to said spring bar, means including a manually adjustable cam for
†degree of flexure
per A *varying the* ∧ *(flexibility) of said spring bar for accommodating different temperatures, and an indicator adjustable proportionate to said cam for indi-*

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†its proper adjustment at
per A *cating* ∧ *(said) different temperatures, substantially as specified.*

7. In a scale, the combination of the load counterbalancing springs, means for applying load to said springs, an indicator, a driving connection between said indicator and said springs, manually adjustable
per B *means for compensating for (the different degrees)* †*variations in the elongation of the springs under tension, due to change*
per A ∧ *of temperature to which said load counterbalancing springs may be subject and an indicator for indicating the adjustment, substantially as specified.*

8. In a scale, the combination of the load counterbalancing springs, means for applying load to said springs, an indicator, a driving connection between said indicator and said springs, and means including a manually adjustable cam for compensating for
per A †*variations in the elongation of the springs under tension, due to change*
per B ∧ *(the different degrees) of temperature to which said load counterbalancing springs may be subjected, substantially as specified.*

9. In a scale, the combination of the load counterbalancing springs, means for applying load to said springs, an indicator, a driving connection between said indicator and said springs, means including a manually adjustable cam for compensating for (the
per B †*variations in the elongation of the springs under tension, due to change*
per A *different degrees)* ∧ *of temperature to which said load counterbalancing springs may be subject, and an indicator actuated by said cam for indicating the said adjustment of said cam, substantially as specified.*

10. In a scale, the combination with the springs and rack bars at opposite ends, a cylindrical indicator mounted between said springs and rack bars at opposite ends, a bar between and connected to said springs, an independent bar between and connected to said rack bars, said independent bar being loosely connected at its center to said first bar; means for applying load to said second bar; a third bar con-
†*adjustable*
per A *nected at its ends to said first bar; and (variable)*

*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

means intermediate the ends of said first and third bars to cause said third bar to act or fail to act †with
per A *(upon) said first bar, substantially as specified.*

11. In a scale, the combination with the springs and rack bars at opposite ends, a cylindrical indicator mounted between said springs and rack bars at opposite ends, a bar between and connected to said springs, an independent bar between and connected to said rack bars, said independent bar being loosely connected at its center to said first bar; means for applying load to said second bar; third and fourth bars connected at their ends to said first bar; and a manually adjustable cam intermediate said first and third and fourth bars to cause said third bar and †with
per A *fourth bars to act or fail to act (upon) said first bar, substantially as specified.*

12. In a scale, the combination with the springs and rack bars at opposite ends, a cylindrical indicator mounted between said springs and rack bars at opposite ends, a bar between and connected to said springs, an independent bar between and connected to said rack bars; said independent bar being loosely connected at its center to said first bar; means for applying load to said second bar; a third bar connected at its ends to said first bar; a manually adjustable cam intermediate the ends of said first and third bars to cause said third bar to act or fail to †with
per A *act (upon) said first bar, and an indicator for indicating the position of said cam, substantially as specified.*

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13. In a scale, the combination with the springs and rack bars at opposite ends, a cylindrical indicator mounted between said springs and rack bars at opposite ends, a bar between and connected to said springs, an independent bar between and connected to said rack bars; said independent bar being loosely
Erased *connected at its center to said first bar; downwardly*
per B *projecting open-mouthed tubes at opposite ends of said scale, pistons slidable in the bores of said tubes,*

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pitmen pivotally connected at their upper ends to said pistons, said pitmen being pivotally connected at their lower ends to the opposite ends of one of said bars; substantially as specified.

†13b

14. In a scale, the combination with the springs and rack bars at opposite ends, a cylindrical indicator mounted between said springs and rack bars at opposite ends, a bar between and connected to said springs, Sub F¹ *an independent bar between and connected to said rack bars; said independent bar being loosely connected at its center to said first bar; means for applying load to said second bar; downwardly projecting open-mouthed tubes at opposite ends of said scale with their longitudinal centers in the same vertical plane with said springs, pistons slidable in the bores of said tubes, pitmen pivotally connected at their upper ends to said pistons by means of balls formed upon the upper ends of said pitmen and bearing in sockets formed in the lower ends of said pistons, said pitmen being pivotally connected at their lower ends to the opposite ends of said first bar, substantially as specified.*

†14b

15. In a scale, the combination of a casing, a re-

†an

per A *voluble indicator therein, (one or more)* ∧ *adjustable exposing openings for exposing the indications on*

†a

per A *said indicator,* ∧ *(one or more) weight counterbal-*
per A *ancing members in driving connection with (said*
Sub B² *indicator, and means for independently suspending*
per A *said casing and said member or members, substantially as spevified.)*

†15b

16. In a scale, the combination of a cylindrical casing, a cylindrical indicator revolubly mounted therein and provided with a series of peripherical rows of

†an

per A *price indications, (one or more)* ∧ *adjustable exposing openings for exposing said indications on said*

†a

per A *indicator, (one or more)* ∧ *load counterbalancing*

*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

per A *members near each end of said casing and in driving connection with said indicator, a load receiver connected to said counterbalancing members, and a member extending across the top of said casing and to to which said casing and counterbalancing members* †*loosely and with respect to each other and*
per B *are* ^ *independently suspended,* ^ *substantially as*
Insert B³ *specified.*

†16b

17. In a scale, the combination of a casing, suspension means therefor, an indicator mounted in said casing, a draft bar movable proportionate to the load applied thereto, means for applying a load to said draft bar, a driving connection between said draft bar and indicator, said draft bar projecting through a slot in said casing, and means for adjusting the center of gravity of said casing to remain in a plane passing through the plane in which are said suspension means for the casing and said means for applying a load to the draft bar, substantially as specified.

17b

18. In a scale the combination of a casing, a suspension means therefor, an indicator mounted in said casing, a draft bar movable proportionate to the load applied thereto, means for applying a load to said draft bar, a driving connection between said draft bar and indicator, said draft bar projecting through a slot in said casing, and a weight mounted within said casing and adjustable at an angle to the direction of movement of said draft bar for adjusting the center of gravity of said casing to obviate frictional contact between said casing and draft bar, substantially as specified.

†18b

19. In a scale, the combination of a casing, suspension means therefor, an indicator mounted in said casing, a draft bar movable proportionate to the load applied thereto, means for applying a load to said draft bar, a driving connection between said draft bar and indicator, said draft bar projecting through a slot in said casing, and weights mounted within said

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per A *casing and upon opposite sides* †*of its center of gravity* ∧ *and adjustable at an angle to the direction of movement of said draft bar for adjusting the center of gravity of said casing, substantially as specified.*

†19b

20. In a scale, the combination of a casing, an indicator revolubly mounted therein and provided with a series of rows of characters indicating prices at different rates per unit, load counterbalancing means within said casing, a driving connection between said load counterbalancing means and said indicator, means for independently suspending said casing and said load counterbalancing means, and a weight adjustably secured to said casing for adjusting the center of gravity of said casing, substantially as specified.

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21. In a scale, the combination of a casing, load counterbalancing means, an indicator, a driving connection between said load counterbalancing means and indicator, said indicator consisting of a webbed frame, a sheet of light material provided with a series of price indications at different rates per unit, and a band passing around the periphery of said frame and confining the edge of said sheet between said band and the periphery of said frame, substantially as specified.

22. In a scale, the combination of a casing, a load counterbalancing means, an indicator, a driving connection between said load counterbalancing means and indicator, said indicator consisting of a webbed frame, a sheet of light material provided with a series of price indications at different rates per unit, a band

Erased per A *passing around the periphery of said frame, and confining the edge of said sheet between said band and the periphery of said frame, and means for securing said band to said frame, substantially as specified.*

23. In a scale, the combination of a casing, load counterbalancing means, an indicator, a driving connection between said load counterbalancing means and indicator, said indicator consisting of a plurality of webbed frames, a sheet of light material provided

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with a series of rows of price indications at different rates per unit and extending in a cylindrical form around the peripheries of said frames, and bands passing around said cylindrical sheet and confining the same to the peripheries of said frames, substantially as specified.

24. In a scale, the combination of a casing, load counterbalancing means, an indicator, a driving connection between said load counterbalancing means and indicator, said indicator consisting of a plurality of webbed frames, a sheet of light material provided with a series of rows of price indications at different rates per unit and extending in a cylindrical form around the peripheries of said frames, bands passing around said cylindrical sheet and confining the same to the peripheries of said frames, and means for securing each of said bands to their respective frames, substantially as specified.

25. In a scale, the combination of an indicator consisting of a webbed frame, a sheet of light material coated upon opposite sides with a moisture resisting substance, means for securing said sheet to said frame, and a plurality of rows of price indications at different rates per unit upon one side of said sheet, substantially as specified.

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†20b

21a *26. In a scale, the combination of an indicator consisting of a plurality of circular webbed frames, a sheet of light material provided on each of its opposite sides with a coat of moisture-resisting material,*

Sub F1 *a plurality of rows of price indications at different rates per unit and running lengthwise of said sheet, each of said rows of indications beginning at a point different from the meeting edges of said sheet*

per A *(means for securing together) the meeting edges of* †being secured together *said sheet* ∧ *when said sheet is rolled in the form of a cylinder about the peripheries of said frames, and bands passing around said peripheries of said frames, substantially as specified.*

27. In a scale the combination of an indicator consisting of a spindle carrying said indicator, and a

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†Matter in small type, inserted in red ink in original transcript.

Erased per A

weight adjustable closer to or farther from said spindle to adjust the center of gravity of said indicator to coincide with its axis of rotation, substantially as specified.

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†21b

22a *28. In a scale, the combination of a casing, a load counterbalancing means and an indicator mounted therein, a driving connection between said counterbalancing means and said indicator extending through a slot in said casing and adapted to connect said load counterbalancing means with a load, a weight adjustably mounted upon said casing for adjusting the center of gravity of said casing, and a weight adjustably mounted upon said indicator for adjusting the center of gravity of said indicator to coincide with its axis of rotation, substantially as specified.*

Sub F¹

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†23a

29. In a scale the combination of a casing, an indicator within said casing, an exposing opening through said casing for exposing indications upon said indicator, a transparent member covering said exposing opening, a frame for said transparent member, means for adjustably securing said frame to said casing, and a designating member adjustably with said transparent member and said frame for designating the particular indications exposed through said transparent member which are to be read as the true indication, whereby the adjustment of said frame correspondingly adjusts said designating means for correction of the indication, substantially as specified.

Erased per B

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†24a 22b

30. In a scale, the combination of a casing, an indicator mounted within said casing and counterbalancing means, a driving connection between said counterbalancing means and said indicator, an exposing opening in said casing through which indications upon said indicator are exposed, an arc shaped transparent member covering said exposing opening, a frame in which said member is mounted, means for adjustably securing said frame to the casing, and means adjustable with said frame and said transparent member for designating which of the indications exposed

Sub F¹

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*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

through said exposing opening are to be read for the true indication, whereby the adjustment of said frame and said transparent member correspondingly adjusts said designating means and corrects the indication, substantially as specified.

†25a 23b

Erased per E (June 27/00) per C per A Insert B⁴

31. In a scale, the combination of the load counterbalancing springs, means for applying load to said springs, an indicator, a driving connection between said indicator and said springs †manually ∧ *adjustable means for compensating for (the different degrees)* †variations in the elongation of the springs under tension due to change ∧ *of temperature to which said load counterbalancing springs may be subjected and an indicator for indicating the adjustment, substantially as specified.*

Erased per A

32. In a scale the combination with a load support constituting a central point of attachment from which the load may be pivotally suspended and counterbalancing springs pivotally connected therewith at diametrically opposite points, of relatively fixed pneumatic dash pot cylinders located at diametrically opposite points with relation to said load support, pistons in said cylinders and piston rods therefor pivotally connected with the load support at diametrically opposite points in line with the connections between the said load support and its counterbalancing springs; substantially as described.

†26a

Erased per B

33. In a scale the combination with a pair of relatively fixed pneumatic dash pot cylinders, pistons in said cylinders piston rods therefor and a horizontal part pivotally connected with both said rods, of a load support centrally connected with said horizontal part, counterbalancing springs pivotally connected with said horizontal part between the piston rods, an indicator and an operating mechanism therefor centrally connected with said horizontal part; substantially as described.

†27a

34. In a scale the combination with a rotary indi-

*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

cator journaled on a horizontal axis and bearing indications on its periphery, a load support and driving connections between the load support and indicator, of pneumatic dash pot cylinders located at opposite ends of the indicator shaft and in the same vertical plane with its axis, pistons in said cylinders and piston rods pivotally connecting said pistons and the load support; substantially as described.

In Witness Whereof, I have hereunto set my hand this 15" day of September 1899.

ALBERT U SMITH
Inventor.

Witnesses.
RUFUS WAKEMAN.
GEORGE H. SLOVEN

Oath.

United States of America,
State of Connecticut,
County of Fairfield. } ss.

Albert U. Smith, the above named petitioner, being sworn deposes and says that he is a citizen of the United States of America and resident of the city of Saugatuck, in the County and State aforesaid; that he verily believes himself to be the original first and sole inventor of the improvement in Weight and Price Indicating Scales described and claimed in the anneexd specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof, or patented or described in any printed publication in any country before his invention or discovery thereof, for more than two years prior to this application, or in public use or on sale in the United States for more than two years prior to this application; and that no application for patent on said improvement has been filed by himself or his representatives or assign in any country foreign to the United States.

ALBERT U. SMITH

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*Matter in italics in parentheses, stricken out in original transcript.

Sworn to and subscribed before me this 15 day of September, 1899.

RUFUS WAKEMAN
Notary Public within and for Fairfield County, Conn.

(Notarial Seal)

This 4th day of December 1899, the above named Albert U. Smith personally appeared before me and swore that the above facts are still true.

LEVI D. HELLER,
Notary Public in and for Montgomery County, Ohio.

(Notarial Seal)

(Endorsed) Serial No. 8021 Paper No. 1/2 Application Filed Mch. 9, 1900 Smith, A. U. None U. S. Patent Office Mar 9 1900 Chief Clerk U. S. Patent Office Mar 12 1900 Division 36.

Commissioner of Patents,
Washington, D. C.
Dear Sir:—

In the matter of the application for patent of Albert U. Smith, of Saugatuck, Fairfield County, Connecticut, executed on September 15th, 1899, for Weight and Price Indicating Scales, you will please recognize the firm of Church & Church, Washington, D. C., composed of Melville Church and J. B. Church, as my associates in the prosecution of this case with full power to make alterations and amendments therein, and to transact all business in the Patent Office connected therewith.

Respectfully yours,

IRA C. KOEHNE

Dayton, Ohio, March 7th, 1900.
(25c Revenue Stamp.)
ICK
3/7 1900
25
U. S.
Revenue Stamp
———Cents

(Endorsed) Serial No. 8021 Paper No. 1 Associate Power of Atty Filed March 9" 1900 U. S. Patent Office Mar 12 1900 Division 36.

2—260

Div. ..... Room No. 261. Paper No. .....

Address only "The Commission of Patents, Washington, D. C."

All communications respecting this application should give the serial number, date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
United States Patent Office
Washington, D. C., April 2, 1900.
Mailed " " "

A. U. Smith,
C/o Church & Church,
City.

Please find below a communication from the Examiner in charge of your application.

Ser No. 8,021, Filed March 9, 1900? for "Weight and Price Indicating Scales."

C. H. DUELL
Commissioner of Patents.

Upon a careful examination of this application the following criticisms suggest themselves:

The statement in line 7 of page 12 does not seem to be correct. The mechanism referred to compensates for the changes due to change in temperature, but does not compensate for the temperature. The same objection applies to claims 7, 8, 9 and 31. The modification referred to in the first four lines of the last paragraph of page 15 should be illustrated, or reference thereto erased. Claims 1-6 are incorrect in specifying means for "varying the flexibility of the spring bar." The device presented does not include any means for varying the flexibility of the spring bar. The spring bar is just as flexible when the supplemental bars are connected to operate with it, as it was before. Claims 3 and 6 are incorrect in alleging that the device includes means for indicating temperature. It only includes means which indicate adjustments. It is believed that claim 10 will be improved by substituting adjustable for "variable" in line 8, and with for "upon" in line 10. With should be substituted for "upon" in line 11 of claim 11, and a similar substitution should be

made in line 10 of claim 12. The bars cannot properly be said to act upon the spring bar, though they do act with it. Claims 15 and 16 are alternative in the expressions "one or more" and "member or members". The location of the weights mounted within the casing has been indefinitely specified in claim 19. Claim 26 includes "means for securing together the meeting edges of said sheet", which means have not been disclosed. The first two lines of claim 27 are ambiguous. The first four lines of claim 32 are ambiguous.

Claims 7, 8, 9 and 31 are rejected upon the patent to Haerter, No. 345,049, July 6, 1886, Spring Scales. It would not involve invention to provide the adjusting screw of Haerter's device with a scale indicating the degree of adjustment.

Claims 13, 32, 33 and 34 are rejected upon applicant's former patent, No. 597,300, Jan. 11, 1898, Price Scales, in view of the English patent, No. 9,053 of 1898. In view of the disclosure in the English patent, it would not involve invention to provide the scale formerly disclosed by applicant, with pistons for preventing violent vibrations. Such an adaptation is well within the skill of a mechanic versed in the art of scale making.

Claims 15 and 16 are rejected upon the patent to Babcock, No. 421,805, Feb. 18, 1890, Price Scales, in view of either the patent to Churchill, No. 596,052, Dec. 28, 1897, Price Scales, of the patent to Johnson, No. 514,471, Feb. 14, 1894, Spring Scales. Each of the latter two patents discloses the use of adjustable exposing slots, and it would involve no invention, therefore, to arrange the scale shown by Babcock with an adjustable exposing slot.

Claims 21, 22, 23, 24, 25 and 26 are rejected upon applicant's former patent, No. 545,616, Sept. 3, 1895, Price Scales. The method of fastening the computing chart to the frame work of the cylinder is merely that used to fasten the staves of a barrel to the heads, namely, a hoop, and it would involve no invention to apply this expedient to the manufacture of computing cylinders.

Claim 27 is rejected, either upon the patent to Stephens, No. 628,559, July 11, 1899, or upon the patent to Phelps, No. 438,753, Oct. 21, 1890, both in Price Scales.

Claim 29 is rejected upon the patent to Johnson, cited above, as it would not involve invention to cover the exposing opening in the face plate of Johnson's scale, with a glass cover.

Claim 30 is rejected upon the patent to Lyon, No. 600,837, March 15, 1898, Price Scales, in view of the fact that it is

old, as has been shown in references cited above, to provide adjustable exposing openings in the cases of computing scales.

GEORGE L. MORTON
Examiner Div. 36

F. F. R.

(Endorsed) Serial No. 8,021 Paper No. 2 Rejection Dated April 2, 1900 Smith, Albert U.

A. U. Smith
Weight & Price Indicating Scales
Filed March 9, 1900
No. 8021

A Hon. Commissioner of Patents,
Sir:

Please amend the above entitled case as follows:

√Page 12, line 7, cancel "the different degrees of" and insert "variations due to changes in".

√Page 15, line 15, cancel "rigidly secured to the hook or receiver (15) and the "and insert "in the form of a".

√Claim 1, line 6, cancel "flexibility" and insert "degree of flexure".

√Claim 2, line 6, cancel "flexibility" and insert "degree of flexure".

√Claim 3, line 6, cancel "flexibility and insert "degree of flexure". Line 8, after "indicating" insert "its proper adjustment at".

√Claim 4, line 5, cancel "flexibility" and insert "degree of flexure".

√Claim 5, line 5, cancel "flexibility" and insert "degree of flexure".

√Claim 6, line 5, cancel "flexibility" and insert "degree of flexure". Line 7, cancel "said" and insert "its proper adjustment at"

√Claim 7, line 5, cancel "the different degrees" and insert "variations due to change".

√Claim 8, line 5, cancel "the different degrees" and insert "variation due to change".

√Claim 9, line 5, cancel "the different degrees" and insert "variation due to change".

√Claim 10, line 8, cancel "variable" and insert "adjustable" √Line 10 cancel "upon" and insert "with".

√Claim 11, last line cancel "upon" and insert "with."

√Claim 12, line 10 cancel "upon" and insert "with"

A reconsideration of claims 7, 8, 9 and 31, rejected on the Haerter patent is asked, as in said patent no adjustment can be made for compensating for variation due to changes in temperature. The simple ordinary vertical adjustment of the entire spring bodily will not answer the purpose at all.

In a practical sense the variation in the actual distance in a straight line between the two end attaching points of the two springs amounts to nothing and the bodily movement of the spring could only readjust the indicator to overcome that, but if the spring were one inch in diameter and had eighteen coils as in the Haerter structure the length of wire would be somewhat over 56 inches and a very slight change in temperature would vary this length materially and in accordance with the law governing the action of springs a given weight would cause a greater elongation with a long than with a short spring. The variation due to this cause is the variation applicant overcomes. To put it another way, assume that at 90° a scale showed an over weight of 2 oz. with a 20 lb. weight, when the weight is removed the pointer would return to zero or so close to it that with the ordinary scales the variation would not be noticed. To compensate for the 2 oz. variation Haerter would have to draw his springs up until instead of starting at the zero point, he would have to start with the indicator a space of 2 oz. further back, and the scale would indicate correctly only for a 20 lb. weight. If it were an unknown weight, obviously he could not set the scale correctly and if he had indications on his adjusting screw he would have to have a set for each weight and at each temperature at which the scale would work.

To put it still another way, whenever the Haerter and similar devices are adjusted the position of the indicator hand is changed, but this is not the case with applicant's device wherein the hand will return to zero regardless of

the adjustment to compensate for variation due to changes in temperature.

It occurs to us that perhaps the Examiner has overlooked the fact that the bars 14 and 150 are spring bars and yield in proportion to the weight on the scale but return to normal when the weight is removed and consequently if the bars are coupled together there will be less flexure than when one or two only support the weight and by providing a series of bars properly proportioned and coupling devices for any number of them provision may be made for weighing at any temperature.

A reconsideration of claims 13, 33 and 34 is asked. Admitting that pneumatic dash pots were old in types of scale having a dial and pointer it is thought that to apply such devices to this type of scale where the application is not obvious called for the exercise of invention. The claims are specific to applicants type of scale and in this type of scale the check cylinders could not be applied in the same manner as in the old forms of scale. After an object has been attained it is an easy matter to say that no invention was required in its accomplishment, but thousands of these scales were made and sold before the problem of applying these checks thereto was solved. The checks must have too great length to be applied centrally and because of the shape and position of the working parts especially the great length of the cylinder, it was deemed impractical to secure the advantages of such checks although the need for them was very urgent.

√Claim 15, line 2, cancel "one or more" and insert "an". √Line 3, cancel "one or more" and insert "a". √Line 4 change "members" to "member". √Line 6, cancel "or members".

√Claim 16, line 4, cancel "one or more" and insert "an", √Same line change "openings" to "opening". √Line 5 cancel "one or more" and insert "a". √Line 6, change "members" to "member".

The limitation in these claims to the casing and counterbalancing members independently suspended so that the movement of one does not influence the other in their gravity positions would seem to impart patentability to the claims. This

feature of the claims seems to have been overlooked by the Examiner.

√Claim 19, line 7, after "sides" insert "of its center of gravity".

√Cancel claims 21, 22, 23, 24 and 25.

√Claim 26, line 8, cancel "means for securing together".

√After line 8 insert "being secured together". As now drawn this claim is thought to be patentable. Applicants prior structure is entirely different.

√Cancel claim 27.

A reconsideration of claim 29 is asked as it would not be met by the Johnson structure even though it had a glass cover for the exposing aperature. The claim calls for an adjustable frame for said glass and a designating member adjustable with said frame.

The same remarks apply to the 30th claim as it is also limited to a transparent member adjustable on its support and a designating member adjustable with such transparent member. This is a detail of construction developed by the perfecting of this type of scale and servec a most useful function in enabling the scale to be manufactured to a standard in quantities and subsequently scaled or adjusted individually with the greatest accuracy and with the minimum labor.

√Claim 31 lines 4 and 5 cancel "the different degrees" and insert "variation due to change".

√Cancel claim 32.

Respectfully,

A. N. Smith,
by Church & Church
His Attorneys.

April 24, 1900.

(Endorsed) Serial No. 8021 Paper No. 3 Amendment A Filed Apr 24 1900. Smith A. U. None U. S. Patent Office Apr 24 1900 Division 36.

2—260

Div. ..... Room No. 261. Paper No. .....

Address only "The Commissioner of Patents, Washington, D. C."

All communications respecting this application should give the serial number, date of filing, and title of *invention.*

DEPARTMENT OF THE INTERIOR
United States Patent Office
Washington, D. C., May 7, 1900.
Mailed " " "

A. U. Smith,
C/o Church & Church,
City.

Please find below a communication from the Examiner in charge of your application Ser No. 8,021. filed March 9, 1900, for "Weight and Price Indicating Scales."

C. H. DUELL
Commissioner of Patents.

This application has been considered in connection with the amendment filed April 24, 1900.

The first claim, as it stands, must be rejected upon applicant's former patent, No. 597,300, Jan. 11, 1898, Price Scales, as the load placed upon the scale is a manually adjustable means for varying the degree of flexure of the spring bar 15. This construction might be avoided by inserting for "means" in line 5, independent of the load.

Claims 7, 8, 9 and 25 are again rejected upon the patent to Haerter, of record, as this patent presents a structure which meets the terms of the claims. While it is true, as applicant points out in his argument, that the adjustment of the Haerter device does not effect the same compensation that applicant's does, yet it effects a compensation covered by the terms of these claims. Applicant has not brought out in the claims the distinction relied upon in his argument.

Claims 13, 26 and 27 are rejected upon applicant's former patent, No. 597,300, in view of the English patent of record, or in view of the English patent to Ozias, No. 15,046, of 1898. The latter patent shows the use of two clinders; one at either end of the transverse arm of the draw bar, and it is clear

that it would involve no invention to similarly equip the scale shown in applicant's patent.

Claims 15 and 16 must be again rejected upon the same references as cited against them in the last office letter. The patent to Babcock clearly shows a scale in which the counterbalancing member, and the casing and indicator are independently suspended. Here again, applicant has failed to introduce in the claims the distinction which he relies upon in his argument. There is nothing in the wording of the claims to indicate that the suspension is of such a character that the casing and the counterbalancing members can vibrate independently of each other.

Claim 23 is rejected upon the patent to Johnson, in view of the patent to Lyon, both of record. In the Johnson patent the designating means is adjusted when the frame is adjusted, since the designating means is the edge of the slot through which the price dial is exposed. However, the patent to Lyon shows a designating member upon a transparent member covering the slot through which the computing chart is exposed, and in view of Johnson's disclosure it would not involve invention to adjust the frame in which the transparent member is carried.

GEO. L. MORTON
Examiner Div. 36.

F. F. R.

(Endorsed) No. 8,021 Paper No. 4 Rejection Dated May 7, 1900 Smith, A. U.

Albert U. Smith
Weight & Price Indicating Scales
B Filed March 9, 1900.
No. 8021

Hon. Commissioner of Patents,
Sir:—
Please amend the above entitled case as follows:—
√At the end of the specification insert—

"The cylinders 102 it will be observed are removably attached outside of the other portions of the scale mechanism and furthermore that the lower ends of the piston
B¹ rods are connected with the bar 14 so as to be readily detachable therefrom, thus said parts may be readily separated for cleaning, oiling or repairing. The piston rod

may be separately detached from the draft mechanism, the piston drawn out and the parts cleaned with the greatest facility without disturbing or disconnecting the other scale mechanism."

√Claim 1, line 5, after "means" insert "independent of the load."

√Claim 7, 8 and 9, lines 5 cancel "variation due to change" and insert "variation in the elongation of the springs under tension, due to change"

√ √ √
√Cancel claims 13, 26 and 27.

√Claim 15, cancel the last two lines and insert

√"said indicator, a support and independent connections,
B² loose with respect to each other, between said casing and said member and the support whereby said casing and said member may vibrate independntly with the support as an axis; substantially as described.

√Claim 16, next to last line before "independently" insert "loosely with respect to each other and" √Same line after "suspended" insert |"and constituting an axis
B³ about which said casing and said counterbalancing member may vibrate independently."

√Cancel claim 23.

Insert the following claims—

24b *(*In a scale the combination with a casing, a draft member, counterbalancing means for said draft member and load and an indicator moved by the draft*
Erased *member, of a pneumatic dash pot cylinder, a piston*
per C *working therein, a piston rod and a detachable connection between the piston rod and draft member located outside of the casing; substantially as described.*

25b *In a scale the combination with a casing, a draft member, counterbalancing means for said draft mem-*
B⁴ *ber and load and an indicator moved by the draft member, of a pnumatic dash pot cylinder secured to the exterior of the casing, a piston in said cylinder*

*Matter in italics in parentheses, stricken out in original transcript.

and a piston rod for said piston detachably attached to the draft member; substantially as described.

24c-26b 23c Sub F[1] *In a scale the combination with a casing, a draft member, a drum indicator journaled in the casing, counterbalancing springs located at opposite ends of the indicator axis and a connection between the draft member and indicator whereby the indicator is rotated, of pneumatic dash pot cylinders secured to the casing and located outside of the springs and in line with the axis of the drum, pistons in said cylinders and piston rods detachably connected with the draft member; substantially as described.)*

Insert D[1]>

Respectfully,
ALBERT U. SMITH,
by CHURCH & CHURCH
His Attorneys.

May 31-1900

(Endorsed) Serial No. 8021 Paper No. 5 Amendment. B Filed May 31, 1900. Smith, A. U. None U. S. Patent Office, May 31 1900 Division 36.

2—260

Div. ..... Room No. 261. Paper No. .....

Address only "The Commissioner of Patents, Washington, D. C."

All communications respecting this application should give the serial number, date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
United States Patent Office
Washington, D. C., June 5, 1900.
Mailed " " "

A. U. Smith,
C/o Church & Church,
City.

Please find below a communication from the Examiner in

*Matter in italics in parentheses, stricken out in original transcript.

charge of your application Ser No 8,021, filed March 9, 1900, for "Weight and Price Indicating Scales."

C. H. DUELL
Commissioner of Patents.

This application has been examined in connection with the amendment filed May 31, 1900.

Claim 23 is rejected upon the patent to Haerter, of record, upon the grounds fully set forth in the last office letter.

Claims 24 and 25 are rejected upon the patent to Bull, No. 30,752, Sept. 20, 1844, Spring Scales, in view of the patent to Donne, No. 423,035, March 11, 1890, Coin Controlled Apparatus: Testers. The patent to Bull shows a dash pot cylinder fastened to the outside of the casing, and the draft bar and piston rod connected outside of the casing. It would not involve invention to connect the draft bar and piston rod by a detachable connection, such as Donne has shown.

In view of a possible interference, applicant is requsted, under Rule 96, to put his case in condition therefor within twenty days from date.

GEO. L. MORTON
Examiner Div. 36.

F. F. R.

(Endorsed) Serial No. 8,021 Paper No. 6 Rejection Dated June 5, 1900 Smith, Albert U.

A. U. Smith
Weight & Price Indicating Scales
Filed March 9, 1900
Serial No. 8,021.
C

Hon. Commissioner of Patents,
Sir:

Please amend the above entitled case as follows:

√Claim 23 lines 4 and 5, cancel "the different degrees" and insert "variations in the elongation of the springs under tension due to change".

This claim now accords with the other allowable claims in the case and it is thought should pass.

√Cancel claims 24 and 25.

If there is to be an interference with this case it is requested that it be expedited as these scales are being largely manu-

factured and any delay is highly prejudicial to applicants interests.

Respectfully,
A. U. SMITH,
By CHURCH & CHURCH
his attorneys.

June 11th, 1900.

(Endorsed) Serial No. 8021 Paper No. 7. Amendment C Filed June 11 1900. Smith, A. U. U. S. Patent Office June 11 1900 Division 36.

2—260

Div. ..... Room No. 261. Paper No. .....

Address only "The Commissioner of Patents, Washington, D. C."

All communications respecting this application should give the serial number, date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
United States Patent Office
Washington, D. C., June 25, 1900.
Mailed " " "

Albert U. Smith,
C/o Church & Church,
City.

Please find below a communication from the Examiner in charge of your application Ser No. 8,021, filed March 9, 1900, for "Weight and Price Indicating Scales."

C. H. DUELL
Commissioner of Patents.

This application has been examined in connection with the amendment filed June 11, 1900.

Claim 23 is rejected upon the patent to Ozias, No. 648,289, April 24, 1900, upon the grounds that it would involve no invention to provide the "adjustable means for compensating for variations in the elongation of the springs under tension due to change of temperature" with an indicator for indi-

cating the adjustment. The claim is further rejected upon the patent to Ide, No. 272,699, Feb. 20, 1883, Spring Scales, in view of the patent to James, No. 38,393, May 5, 1863, Watch Balances, Hair Spring, since it would not involve invention to equip the spring of Ide's scale with a regulator, such as James has shown.

GEO. L. MORTON
Examiner Div. 36.

F. F. R.

(Endorsed) Serial No. 8,021, Paper No. 8 Office Letter Dated June 25, 1900 Smith, A. U.

A. U. Smith
Weight & Price Indicating Scales
Filed March 9, 1900.
No. 8021

Hon. Commissioner of Patents,
Sir:—

Please amend the above entitled case as follows:—

√Claim 23, line 4, before "adjustable" insert "manually"

The limitation to a manually adjustable compensating mechanism we think effectively relieves the claim from any conflict with the references cited. In order to set the scale manually to operate correctly at different temperatures an indicator is highly desirable and the indicator is therefore included in the combination. Where the setting is done automatically no indicator is desirable or necessary.

It is hoped that this case may now be passed to issue as the time allowed for preparation for interference has expired.

Respectfully,
A. U. SMITH,
by CHURCH & CHURCH
His Attorneys.

June 26, 1900.

(Endorsed) Serial No. 8021 Paper No. 8½ Amendment. Filed June 27 1900. Smith, A. U. U. S. Patent Office, Jun 27 1900 Division 36.

2—213.

Forwarded from Div. ..... to Examiner of Interferences.

Paper No. .....
(Interference.)
U. S. Patent Office,
June 25 1900
Division 36.

DEPARTMENT OF THE INTERIOR,
United States Patent Office,
Washington, D. C.

"Copy set Assignor."

Mailed June 27, 1900
" " "
#20,603

Mr. Albert U. Smith,
Assignor to "The Computing Scale Co., of Dayton Ohio.
C/o Church & Church, Washington, D. C.

Please find below a copy of a communication from the Examiner concerning your application for "Weight and Price Indicating Scales" filed March 9, 1900, Ser. No. 8,021.

Very respectfully,
C. H. DUELL
Commissioner of Patents.

Room No. 261
Address only
The Commissioner of Patents,
Washington, D. C.
6—1636

Your case, above referred to, is adjudged to interfere with others, hereafter specified and the question of priority will be determined in conformity with the Rules.

The statement demanded by Rule 110 must be sealed up and filed on or before the 20th day of July, 1900, with the subject of the invention, and name of party filing it, indorsed on the envelope. The subject-matter involved in the interference is Issue 1.

In a scale, the combination of the load counterbalancing springs, means for applying load to said springs, an indicator, a driving connection between said indicator and said springs, manually adjustable means for compensating for variation in the elongation of the springs under tension, due to change of temperature to which said load counterbalancing springs may be subject and an indicator for indicating the adjustment.

The other party to this interference is Otto Weise, of New York, N. Y., whose assignee is Richard H. Forschner, doing business as Charles Forschner & Sons, New York, N. Y., and whose attorneys are Foepel & Raegener, 290 Broadway, New York, N. Y.

The above issue is your claim 7, and Wiese's claim 5.

GEO. L. MORTON,
Examiner Div. 36.

F. F. R.

(Endorsed) Serial No. 8,021 Paper No. 9 Interference Letter Dated June 27, 1900 Smith, Albert U.

2—079.

INTERFERENCE CARD.

Interference No. ..... Paper No. 10
Name, A. U. Smith
Seriad No. 8021
Title, Weight & Price Indicating Scale
Filed, Mch 9, 1900—
Interference with Otto Wiese
Ser. No. 5325

Decisions of

Primary Examiner	Dated, June 27/00
Ex'r of Interferences, ...	Dated, ...
Board, ...	Dated, ...
Commissioner, ...	Dated, ...

Remarks:

Decision in favor of Smith
On concession
Nov. 17/00

This should be placed in each application or patent involved interference in addition to the interference letters by Primary Examiner.

6—1970

Hon. Commissioner of Patents,
Washington, D. C.

Dear Sir:—

In the matter of the application for patent for Albert U. Smith, of Saugatuck, Fairfield County, Connecticut, executed September 15th, 1899, for Weight and Price Indicating Scales,

you will please recognize the firm of Church & Church, Washington, D. C., composed of Melville Church and J. B. Church, as our attorneys, with full power to act in the prosecution of this case, to make alterations and amendments therein, and transact all business in the Patent Office connected therewith.

Respectfully yours,

THE COMPUTING SCALE CO.
ORANGE O OZIER
Manager.

Dayton, Ohio, March 7th, 1900.
(25c Revenue Stamp.)
U. S.
Revenue Stamp,
000
3/7/1900
25 Cents.

(Endorsed) Serial No. 8021, Paper No. 11. Power of Atty by Assignees. Filed July 11th 1900 U. S. Patent Jul 11 1900 Office.

Albert U. Smith
Weight & Price Indicating Scales
Filed March 9, 1900
No. 8021
D

Hon. Commissioner of Patents,
Sir:—

Please amend the above entitled case by Inserting the following claim—

√

Sub F[1] †2?c *(*25d *In spring scales, the combination with means*
D[1] *for suspending the load, of counterbalancing springs,*
Per E *a (tension) regulating spring connected therewith and means for regulating the flexure of said spring when load is applied; substantially as described.*)

Insert E[1]>

This claim is substantially claim 1 of the Wiese application with which this case has just been in interference and it is thought that the broad idea should be embodied in this case

*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

leaving the specific construction, not shown herein, for the Wiese application.

Respectfully,

ALBERT U SMITH,
by CHURCH & CHURCH
His Attorneys.

Nov. 22, 1900.

(Endorsed) Serial No. 8021 Paper No. 12 Amendment. D Filed Nov. 22 1900. Smith, A. U. 24— None U. S. Patent Office, Nov 22 1900 Division 36.

2—260

Div. ..... Room No. 261. Price No. .....

Address only "The Commissioner of Patents, Washington, D. C."

All communications respecting this application should give the serial number, date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR

United States Patent Office

Washington, D. C., Nov. 28, 1900.

Mailed " " "

A. U. Smith,
C/o Church & Church,
City.

Please find below a communication from the Examiner in charge of your application Ser No. 8,021, filed March 9, 1900, for "Weight and Price Indicating Scales."

C. H. DUELL
Commissioner of Patents.

This application has bene considered in connection with the amendment filed Nov. 22, 1900.

The new claim filed is not supported by the showing and description of the invention. The clause "a tension-regulating spring" is capable of two constructions; first, that it is a spring which regulates the tension; second, that it is a ten-

sion-spring which performs a regulating function. The first construction is not applicable to the device of this application, as said spring does not regulate the tension; that being purely a function of the load applied to the scale. The second construction might possibly be made to apply to the device shown, but, thus constructed, the phrase becomes tautological. Therefore, it seems that the claim would be rendered much clearer, and free from possibility of misconstruction, if "tension" were cancelled. The claim is incomplete, in including but one regulating spring. With a single spring it is impossible for applicant's device to perform the function specified.

Claim 23 is still under rejection upon the references and grounds cited in the Office letter of June 25, 1900.

GEO. L. MORTON
Examiner Div. 36.

F. F. R.

(Endorsed) Serial No. 8,021 Paper No. 13. Rejection Dated Nov. 28, 1900 Smith, A. U.

Albert U. Smith
Weight & Price Indicating Scales,
Filed March 9, 1900
No. 8021
E

Hon. Commissioner of Patents,

Sir:—

Please amend the above entitled case as follows:—

√Cancel claim 23.

√Claim 25, line 2, cancel the word "tension".

We think applicant is entitled to a claim of the breadth of this claim as it is obvious that the rod 14 is a single spring which is bowed or flexed by the load and the extent of this flexing or bowing is regulated to compensate for variations in temperature. If the Examiner will look at the matter in this light we think he will find we are correct and the claim allowable.

Insert the following claims—

*(*25e In a scale embodying counterbalancing mechanism, and a load support, the combination of a drum having computations of value thereon and*

*Matter in italics in parentheses, stricken out in original transcript.

formed of circular frames, a central spindle on which they are mounted, a sheet of flexible material on which the computations are marked, surrounding said circular frames and securing bands passing around the flexible sheets and having their ends

Sub F[1] *passed through the sheet and secured to the circular frames; substantially as described.*

26e In a scale embodying counterbalancing mechanism and a load support, the combination of a drum having computations of value thereon and formed of circular frames, a central spindle on which they are mounted, a sheet of flexible material on which the computations are marked, surrounding said circular frames in the form of a cylinder with registering openings in the sheet and peripheries of the frames and flexible bands passing around the clyinder and having their ends passed through the registering apertures and held within the cylinder; substantially as described.)

In presenting these two claims we would state that the formation of the cylinder was one of the greatest practical difficulties encountered in the practical manufacture of these scales. The difficulties were largely due to variations in temperature and humidity and only after a long and costly line of experimentation was it discovered that the edges of the sheet at the ends of the cylinder could be successfully held by passing the ends of the band through to the inside without either distorting the cylinder or causing it to give an incorrect registration with the zero mark on the frame. This construction it will be seen secures the cylinder to the frame at one point and allows it to come and go at all other points under the influence of change in temperature or humidity.

Respectfully,

ALBERT U. SMITH,
by CHURCH & CHURCH
His Attorneys.

Dec. 26, 1900.

(Endorsed) Serial No. 8021 Paper No. 14 Amendment. E Filed Dec. 27 1900. Smith, A. U. None U. S. Patent Office Dec. 27 1900. Division 36.

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[1]Matter in italics in parentheses, stricken out in original transcript.

2—260

Div. ..... Room No. 256. Price No. .....

Address only "The Commissioner of Patents, Washington, D. C."

All communications respecting this application should give the serial number, date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR

United States Patent Office

Washington, D. C., Jan. 5, 1901.

Mailed " " "

A. U. Smith,
C/o Church & Church,
City.

Please find below a communication from the Examiner in charge of your application Ser No. 8,021, filed March 9, 1900, for "Weight and Price Indicating Scales."

C. H. DUELL
Commissioner of Patents.

This application has been examined in view of the amendment filed Dec. 27, 1900.

Claim 24, formerly 25, is still subject to objection. The claim fails to define any relation between the means for suspending the load and the remaining elements included in the combination.

Claim 24 is rejected upon the patent to Ozias of record, which patent shows every element of the combination.

Claims 25 and 26, presented in the recent amendment, are regarded as allowable so far as at present advised.

GEO. L. MORTON
Examiner Div. 36.

F. F. R.

(Endorsed) Serial No. 8,021 Paper No. 15 Rejection Dated Jan. 5, 1901 Smith, A. U.

Albert U. Smith
Weight & Price Indicating Scales
Filed March 9, 1900
No. 8021.
F

Hon. Commissioner of Patents,

Sir:—

Please amend the above entitled case by cancelling the claims, and inserting the following:—

1. In a scale, the combination of the load counterbalancing springs, means for applying load to said springs, a spring bar intermediate said load applying means and said springs, an indicator, means for driving said indicator connected centrally to said spring bar, and manually adjustable means independent of the load for varying the degree of flexure of said spring bar, substantially as specified.

2. In a scale, the combination of the load counterbalancing springs, means for applying load to said springs, a spring bar intermediate said load applying means and said springs, an indicator, means for driving said indi-
F¹ dicator connected centrally to said spring bar, and means including a manually adjustable cam for varying the degree of flexure of said spring bar, substantially as specified.

3. In a scale, the combination of the load counterbalancing springs, means for applying load to said springs, a spring bar intermediate said load applying means and said springs, an indicated, means for driving said indicator connected centrally to said spring bar, means including a manually adjustable cam for varying the degree of flexure of said spring bar, and an indicator adjustable proportionate to said cam for indicating its proper adjustment at different temperatures, substantially as specified.

4. In a scale, the combination of the load counterbalancing springs, means for applying load to said springs, spring bars, as indicated, means for driving said indicator connected centrally to one of said spring bars, and manually adjustable means for varying the degree of flexure of said spring bars for accommodating different temperatures; substantially as specified.

5. In a scale, the combination of the load counter-

balancing springs, means for applying load to said springs, a spring bar, an indicator, means for driving said indicator connected centrally to said spring bar, and a manually adjustable cam for varying the degree of flexure of said spring bar for accommodating different temperatures, substantially as specified.

6. In a scale, the combination of the load counterbalancing springs, means for applying load to said springs, a spring bar, an indicator, means for driving said indicator connected centrally to said spring bar, means including a manually adjustable cam for varying the degree of flexure of said spring bar for accommodating different temperatures, and an indicator adjustable proportionate to said cam for indicating its proper adjustment at different temperatures, substantially as specified.

7. In a scale, the combination of the load counterbalancing springs, means for applying load to said springs, an indicator, a driving connection between said indicator and said springs, manually adjustable means for compensating for variations in the elongation of the springs under tension due to change of temperature to which said load counterbalancing springs may be subject and an indicator for indicating the adjustment, substantially as specified.

8. In a scale, the combination of the load counterbalancing springs, means for applying load to said springs, an indicator, a driving connection between said indicator and said springs, and means including a manually adjustable cam for compensating for variation in the elongation of the springs under tension, due to change of temperature to which said load counterbalancing springs may be subjected, substantially as specified.

9. In a scale, the combination of the load counterbalancing springs, means for applying load to said springs, an indicator, a driving connection between said indicator and said springs, means including a manually adjustable cam for compensating for variation in the elongation of the springs under tension, due to change of temperature to which said load counterbalancing springs may be subject, and an indicator actuated by said cam for indicating the said adjustment of said cam, substantially as specified.

10. In a scale, the combination with the springs and

rack bars at opposite ends, a cylinder indicator mounted between said springs and rack bars at opposite ends, a bar between and connected to said springs, an independent bar between and connected to said rack bars, said independent bar being loosely connected at its center to said first bar; means for applying load to said second bar; a third bar connected at its ends to said first bar; and adjustable means intermediate the ends of said first and third bars to cause said third bar to act or fail to act with said first bar, substantially as specified.

11. In a scale, the combination with the springs and rack bars at opposite ends, a cylindrical indicator mounted between said springs and rack bars at opposite ends, a bar between and connected to said springs, an independent bar between and connected to said rack bars, said independent bar being loosely connected at its center to said first bar; means for applying load to said second bar; third and fourth bars connected at their ends to said first bar; and a manually adjustable cam intermediate said first and third and fourth bars to cause said third bar and fourth bars to act or fail to act with said first bar, substantially as specified.

12. In a scale, the combination with the springs and rack bars at opposite ends, a cylindrical indicator mounted between said springs and rack bars at opposite ends, a bar between and connected to said springs, an independent bar between and connected to said rack bars; said independent bar being loosely connected at its center to said first bar; means for applying load to said second bar; a third bar connected at its ends to said first bar; a manually adjustable cam intermediate the ends of said first and third bars to cause said third bar to act or fail to act with said first bar, and an indicator for indicating the position of said cam, substantially as specified.

13. In a scale, the combination with the springs and rack bars at opposite ends, a cylindrical indicator mounted between said springs and rack bars at opposite ends, a bar between and connected to said springs, an independent bar between and connected to said rack bars; said independent bar being loosely connected at its center to said first bar; means for applying load to said bar; downwardly projecting open-mounted tubes at op-

posite ends of said scale with their longitudinal centers in the same vertical plane with said springs, pistons slidable in the bores of said tubes, pitmen pivotally connected at their upper ends to said pistons by means of balls formed upon the upper ends of said pitmen and bearing in sockets formed in the lower ends of said pistons, said pitmen being pivotally connected at their lower ends to the opposite ends of said first bar, substantially as specified.

14. In a scale, the combination of a casing a revoluble indicator therein, an adjustable exposing opening for exposing the indications on said indicator, a weight counterbalancing member in driving connection with said indicator, a support and independent connections loose with respect to each other, between said casing and said member and the support whereby said casing and said member may vibrate independently with the support as an axis; substantially as specified.

15. In a scale, the combination of a cylindrical casing, a cylindrical indicator revolubly mounted therein and provided with a series of peripherical rows of price indications, an adjustable exposing opening for exposing said indications on said indicator, a load counterbalancing member near each end of said casing and in driving connection with said indicator, a load receiver connected to said counterbalancing members, and a member per

†casing

extending across the top of said *(*indicator*) and to G which said casing and counterbalancing members are loosely with respect to each other and independently suspended and constituting an axis about which said casing and said counterbalancing member may vibrate independently; substantially as specified.

16. In a scale, the combination of a casing, suspension "means therefor, an indicator mounted in said casing, a draft bar movable proportionate to the load applied thereto, means for applying a load to said draft bar, a driving connection between said draft bar and indicator, said draft bar projecting through a slot in said casing, and means for adjusting the center of gravity of said casing to remain in a plane passing through the plane in which are said suspension means for the casing and said

*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

means for applying a load to the draft bar, substantially as specified.

17. In a scale, the combination of a casing, a suspension means therefor, an indicator mounted in said casing, a draft bar movable proportionate to the load applied thereto, means for applying a load to said draft bar, a driving connection between said draft bar an indicator, said draft bar projecting through a slot in said casing, and a weight mounted within said casing and adjustable at an angle to the direction of movement of said draft bar for adjusting the center of gravity of said casing to obviate frictional contact between said casing and draft bar, substantially as specified.

18. In a scale, the combination of a casing, suspension means therefor, an indicator mounted in said casing, a draft bar movable proportionate to the load applied thereto, means for applying a load to said draft bar, a driving connection between said draft bar and indicator, said draft bar projecting through a slot in said casing, and weights mounted within said casing and upon opposite sides of its center of gravity and adjustable at an angle to the direction of movement of said draft bar for adjusting the center of gravity of said casing, substantially as specified.

19. In a scale, the combination of a casing, an indicator revolubly mounted therein and provided with a series of rows of characters indicating prices at different rates per unit, load counterbalancing means within said casing, a driving connection between said load counterbalancing means and said indicator, means for independently suspending said casing and said load counterbalancing means, and a weight adjustably secured to said casing for adjusting the center of gravity of said casing, substantially as specified.

20. In a scale, the combination of an indicator consisting of a plurality of circular webbed frames, a sheet of light material provided with a coat of moisture-resisting material, a plurality of rows of price indications at different rates per unit and running lengthwise of said sheet, each of said rows of indications beginning at a point different from the meeting edges of said sheet, the meeting edges of said sheet being secured together when said sheet is rolled in the form of a cylinder about the peripheries of said frames, and bands passing around

said peripheries of said frames, substantially as specified.

21. In a scale, the combination of a casing, a load counterbalancing means and an indicator mounted therein, a driving connection between said counterbalancing means and said indicator extending through a slot in said casing and adapted to connect said load counterbalancing means with a load, a weight adjustably mounted upon said casing for adjusting the center of gravity of said casing, and a weight adjustably mounted upon said indicator for adjusting the center of gravity of said indicator to coincide with its axis of rotation, substantially as described.

22. In a scale, the combination of a casing, an indicator mounted within said casing and counterbalancing means, a driving connection between said counterbalancing means and said indicator, an exposing opening in said casing through which indications upon said indicator are exposed, an arc shaped transparent member coverng said exposing opening, a frame in which said member is mounted, means for adjustably securing said frame to the casing, and means adjustable with said frame and said transparent member for designating which of the indications exposed through said exposing opening are to be read for the true indication, whereby the adjustment of said frame and said transparent member correspondingly adjusts said designating means and corrects the indication, substantially as described.

23. In a scale the combination with a casing, a draft member, a drum indicator journaled in the casing, counterbalancing springs located at opposite ends of the indicator axis and a connection between the draft member and indicator whereby the indicator is rotated, of pneumatic dash pot cylinders secured to the casing and located outside of the springs and in line with the axis of the drum, pistons in said cylinders and piston rods detachably connected with the draft member; substantially as described.

24. In spring scales, the combination with means for suspending the load, of counterbalancing springs for the load support and load, a regulating spring connected therewith and means for regulating the flexure of said spring when load is applied and an indicator connected with the load support; substantially as described.

25. In a scale embodying counterbalance mechanism, and a load support, the combination of a drum having computations of value thereon and formed of circular frames, a central spindle on which they are mounted, a sheet of flexible material on which the computations are marked, surrounding said circular frames and securing bands passing around the flexible sheet and having their ends passed through the sheet and secured to the circular frames; substantially as described.

26. In a scale embodying counterbalancing mechanism and a load support, the combination of a drum having computations of value thereon and formed of circular frames, a central spindle on which they are mounted, a sheet of flexible material on which the computations are marked, surrounding said circular frames in the form of a cylinder with registering openings in the sheet and peripheries of the frames and flexible bands passing around the cylinder and having their ends passed through the registering apertures and held within the cylinder; substantially as described.

Erased per H / per G / per G / per G / per G

27. In a scale, an indicator consisting of a shaft provided with a plurality of circular frames having flanged peripheries, a sheet of light material provided with a plurality of rows of different indications, and running lengthwise of said sheet, said sheet being rolled in the form of a cylinder about the †registering *flanged peripheries of said frames,* ∧ *openings through said sheet and the flanges of a plurality of* †a flexible fastener lying on the outside of said sheet near the *said frames and* ∧ *(means upon the) periphery of said sheet adjacent the flanged peripheries of said* extending from one opening to another and *frames provided with openings, and* ∧ *passing* †bind *through said openings to (secure) said sheet to said frames, substantially as specified.*

Erased

28. In a scale, the combination of a casing, an indicator within said casing and consisting of a shaft mounted in bearings within said casing, a plurality of light circular frames secured to said shaft, a sheet having a plurality of rows of different indi-

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*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

per G *cations running lengthwise of said sheet, each of said rows of indications beginning at a point different from the meeting edges of said sheet, the meeting edges of said sheet being secured together when said sheet is rolled in the form of a cylinder about the peripheries of said frames, openings through said sheet and through a plurality of said frames, means passing through said openings to bind said sheet to the peripheries of said frames, an exposing opening in said casing to expose indications upon said indicator therethrough, load counterbalancing means, a draft bar connected thereto and adapted to support the load and a driving connection between said draft bar and indicator, substantially as specified.)*

†28g 27h

*(29) In a scale, the combination of a casing, a cylindrical indicator within said casing and consisting of a shaft mounted in bearings within said casing, a plurality of light circular frames secured to said shaft, a sheet mounted upon the peripheries of said frames and having a plurality of peripherical rows of different indications, an exposing opening extending longitudinally of this casing for exposing said rows of indications, a pinion rigid on said shaft intermediate said bearings, means for suspending said casing, means for counterbalancing the load and moving proportionate to the weight thereof, a draft bar connected to said counterbalancing means and adopted to support the load, a rack connecting said draft bar and pinion, pneumatic dash pot cylinders removably secured at their closed ends to said casing and located on the outer sides of said load counterbalancing means, said shaft, pinion and rack bar being located between the said dash pot cylinders, pistons in said dash pot cylinders, and extensions on said draft bar, and members pivotally connecting said pistons with said draft bar and extensions; substantially as specified.

†29g 28h

*(30) In a scale, the combination of a casing, a suspension means therefor, an indicator mounted in said casing, a draft bar movable proportionate to the load applied thereto, means for applying a load to said draft bar, a driving connection between said draft bar and

*Matter in italics in parentheses, stricken out in original transcript.
†Matter in small type, inserted in red ink in original transcript.

indicator, said draft bar projecting through a slot in said casing, and a weight independent of but secured to said casing to adjust the center of gravity of said casing to obviate frictional contact between said casing and draft bar, substantially as specified.

Respectfully,
ALBERT U. SMITH,
by CHURCH & CHURCH
His Attorneys.

Jan. 16, 1901

State of Conn. }
County of Fairfield, } ss:

Albert U. Smith, whose application for letters patent for an improvement in Weight & Price Indicating Scales, Serial No. 8201 was filed in the United States Patent Office on or about the 9th day of March, 1900, being duly sworn deposes and says that the subject matter of the foregoing amendment was part of his invention, was invented before he filed his original application above identified, for such invention, was not known or used before his invention, was not in public use or on sale in this country for more than two years before the date of his application and has not been abandoned. Deponent further says that he invented, manufactured and shipped a scale prior to the 20th day of November 1899, and that said scale which was a fully operative and complete commercial scale embodied in its construction a means for suspending the load, counterbalancing springs for the load and its support, a regulating spring connected therewith and means for regulating the flexure of said spring when load was applied and an indicator connected with the load support; said mechanism being identical with that illustrated in the drawings for his application and the drawings for the application were made from said scale and are a correct and exact representation thereof with respect to the features mentioned.

ALBERT U SMITH

Sworn to and subscribed before me this 18" day of January 1901.

RUFUS WAKEMAN
Notary Public.

(Notarial Seal)

(Endorsed) Serial No. 8201 Paper No. 16 Amendement. F Filed Jan. 19 1901 Smith, A. U. Claims 1 to 28 U. S. Patent Office Jan 19 1901 Division 36.

2—260

Div. ..... Room No. 256. Paper No. .....

Address only "The Commissioner of Patents, Washington, D. C."

All communications respecting this application should give the serial number, date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR
United States Patent Office
Washington, D. C., Jan. 31, 1901.
Mailed " " "

A. U. Smith,
C/o Church & Church,
City.

Please find below a communication from the Examiner in charge of your application.

Ser. No. 8,021, filed March 9, 1900, for "Weight and Price Indicating Scales."

C. H. DUELL,
Commissioner of Patents.

This application has been examined in connection with the amendment filed Jan. 19, 1901.

In line 8 of claim 15 "indicator should be casing.

Claim 24 as amended is regarded as allowable, so far as at present advised.

Claims 27 and 28 are rejected upon the patent to Smith, No. 545,616, Sept. 3, 1895, in view of the patent to Swihart, No. 579,194, March 23, 1897, Price Scales, or in view of the very common use of rivets as a means of fastening parts together.

Claims 27 and 28 differ from applicant's former patent only in substituting a fastening, such as a rivet, or such as Swihart has shown, for the paste formerly used for fastening the computing chart to the circular frames.

GEO. L. MORTON,
Examiner Div. 36.

F. F. R.

(Endorsed) Serial No. 8,021 Paper No. 17 Rejection Dated Jan. 31, 1901. Smith, A. U.

Albert U. Smith,
Improvements in Scales
Filed March 9, 1900
No. 8021

G. Hon. Commissioner of Patents,

Sir:—

Please amend the above entitled case as follows:—
√Claim 15, line 8, cancel "indicator" and insert "casing".
√Claim 27, line 6, before "openings" insert "registering"
√Line 7, cancel "means upon the" and insert "a flexible fastener lying on the outside of said sheet near the". √Line 9, before "passing" insert "extending from one opening to another and". √Line 10, cancel "secure" and insert "bind" *C.*

√Cancel claim 28.

Respectfully,
ALBERT U. SMITH,
by CHURCH & CHURCH
His Attorneys.

Feb. 2, 1901.

(Endorsed) Serial No. 8021 Paper No. 18 Amendment G. Filed Feb. 2, 1901 Smith, A. U. U. S. Patent Office, Feb 2 1901 Division 36.

2—260

Div. ..... Room No. 256 Paper No. .....

Address only "The Commissioner of Patents, Washington, D. C."

All communications respecting this application should give the serial number, date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR

United States Patent Office

Washington, D. C., Feb. 18, 1901.

Mailed " " "

A. U. Smith,
C/o Church & Church,
City.

Please find below a communication from the Examiner in charge of your application.

Ser. No. 8,021, filed March 9, 1900, for "Weight and Price Indicating Scales."

C. H. DUELL,
Commissioner of Patents.

This application has been examined in view of the amendment filed Feb. 2, 1901.

Claim 27, as amended, must be rejected upon applicant's former patent, upon the ground that it would involve no invention to sew the computing chart upon the supporting arms, "near the periphery of said sheet" in lines 7 and 8 is a redundant clause, as the preceding clause specifies that the fastener lies on the outside of said sheet.

GEO. L. MORTON,
Examiner Div. 36.

F. F. R.

(Endorsed) Special No. 8,021 Paper No. 19 Rejection Dated Feb 18, 1901 Smith, A. U.

Albert U. Smith
Weight and Price Indicating Scales
Filed March 9, 1900.
No. 8021
Hon. Commissioner of Patents,
H Sir:—

Please amend the above entitled case by cancelling claim 27.

Respectfully,
ALBERT U. SMITH,
by CHURCH & CHURCH
His Attorneys.

March 7, 1901.

(Endorsed) Serial No. 8021 Paper No. 20 Amendment H. Filed Mch 7 1901 Smith, A. U. U. S. Patent Office Mar 7 1901 None Division 36.

2—181.

Revenue Division. Serial No. 8,021.

All Specifications should be addressed to
"The Commissioner of Patents,
Washington, D. C."

DEPARTMENT OF THE INTERIOR,

U. S. Patent Office,

Washington, D. C., March 18, 1901

Albert U. Smith Assor
C/o Church & Church
City

Sir:—

Your Application for a patent for an Improvement In Weight and Price Indicating Scales Filed Mar 9, 1900, has been examined and Allowed.

The final fee, Twenty Dollars, must be paid, and the Letters Patent bear date as of a day not later than Six Months from the time of this present notice of allowance.

If the final fee is not paid within that period the patent will be withheld, and your only relief will be by a renewal

of the application, with additional fees, under the provisions of Section 4897, Revised Statutes. The Office aims to deliver patents upon the day of their date, and on which their term begins to run; but to do this properly applicants will be expected to pay their final fees at least Twenty Days prior to the conclusion of the six months allowed them by law. The printing, photolithographing, and engrossing of the several patent parts, preparatory to final signing and sealing, will consume the intervening time, and such work will not be done until after payment of the necessary fees.

When you send the final fee you will also send, Distinctly And Plainly Written, the name of the Inventor and Title of Invention As Above Given, Date Of Allowance (which is the date of this circular), Date Of Filing, and, if assigned, the Names Of The Assignees.

If you desire to have the patent issue to Assignees, an assignment containing a Request to that effect, together with the Fee for recording the same, must be filed in this Office on or before the date of payment of final fee.

After issue of the patent uncertified copies of the drawings and specifications may be purchased at the price of 5 cents each. The money should accompany the order. Postage stamps will not be received.

Respectfully,

C. H. DUELL
Commissioner of Patents.

☞After allowance, and prior to payment of the final fee, applicants should carefully scrutinize the description to see that their statements and language are correct, as mistakes not incurred through the fault of the office, and not affording legal grounds for reissues, will not be corrected after the delivery of the letters patent to the patentee or his agent.

(Printed on left-hand margin) ☞In remitting the final fee give the serial number at the head of this notice.

(Printed on right-hand margin) ☞If payment is made by check or draft, the credit allowed is subject to the collection of the same.

2—327.

Amount Received
$20
Chief Clerk.

Memorandum
of
Fee Paid At United States Patent Office.

(Be careful to give correct Serial No.)

Serial No. 8021, 190

Inventor: Albert U. Smith

Patent to be issued to Assignee

Name of invention, as allowed: Weight & Price Indicating Scale.

Date of payment: May 4, 1901

Fee: Final $20

Date of filing: March 9, 1900

Date of circular of allowance: March 18, 1901

The Commissioner of Patents will please apply the accompanying fee as indicated above.

CHURCH & CHURCH
Attorney.

Send patent to Computing Scale Co., Dayton, Ohio.

(Endorsed) Mail Room May 4 1901 U. S. Patent Office.

(Here follows Letters Patent No. 674,883, a copy of which has been heretofore set out in this record and not reproduced here.)

73 Measuring Instruments,
Price Scales.
1900

Contents:

1/2
Application. 1 paper*(*s*) O. K.
1. Assoc. Atty. Mar. 9″ 1900
√2. Rejection Apr. 2″ 1900
√3. Amendment A Apr. 24, 1900.
√4. Rejection May 7, 1900
√5. Amendment B May 31, 1900
√6. Rejection June 5, 1900
√7. Amendment C June 11, 1900.
√8. Letter June 25, 1900
8½. Amendment June 27/00.
√9. Interference Letter June 27, 1900.
10. Intf. Card.
11. Power of Atty by Assee's July 11/1900.
√12. Amendt. D Nov. 22, 1900.
√13. Rejection Nov. 28, 1900.
√14. Amendt. E. Dec. 27, 1900.
√15. Rejection Jan. 5, 1901
√16. Amendt. F Jan. 19, 1901.
√17. Rejection Jan. 31, 1901.
18. Amendt. G. Feb. 2, 1901.
√19. Rejection Feb. 18, 1901.
√20. Amendt. H. Mch. 7, 1901.
21.
22.
23.

Title: Improvement in Weight and Price Indicating Scales.

73. Measuring Instruments,
Price Scales.
1900

Contents:

1/2
Application 1 paper. O. K.
1.
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7. Old Wrapper
8. With Record Of Actions
9. Inside.
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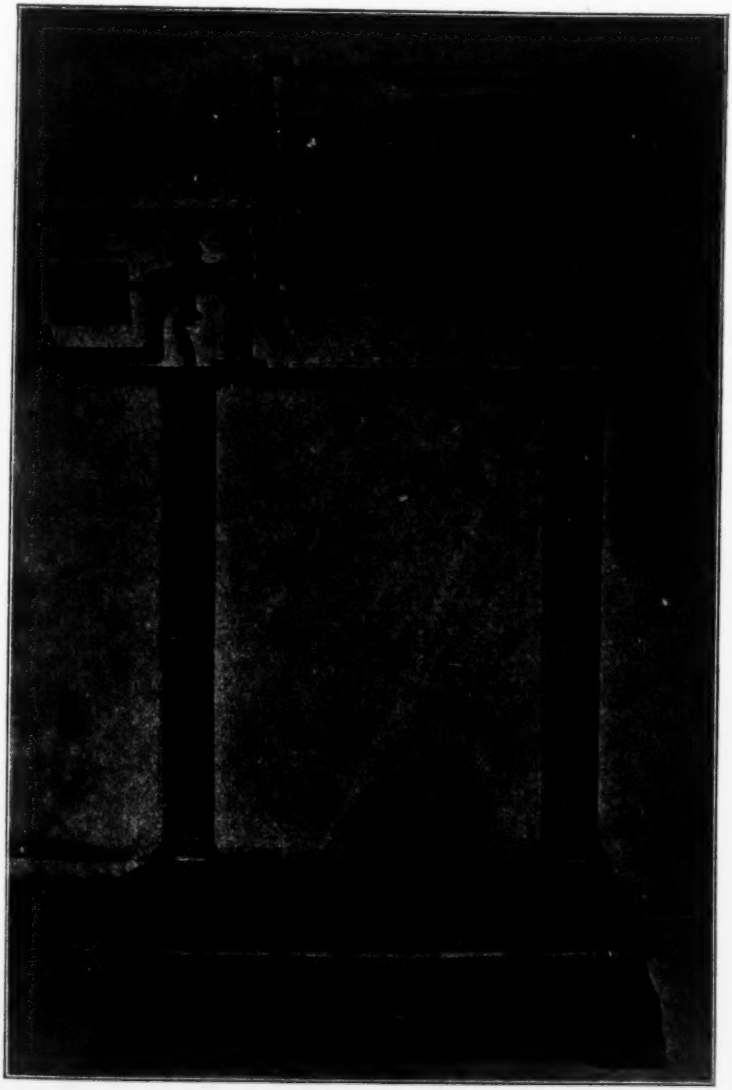
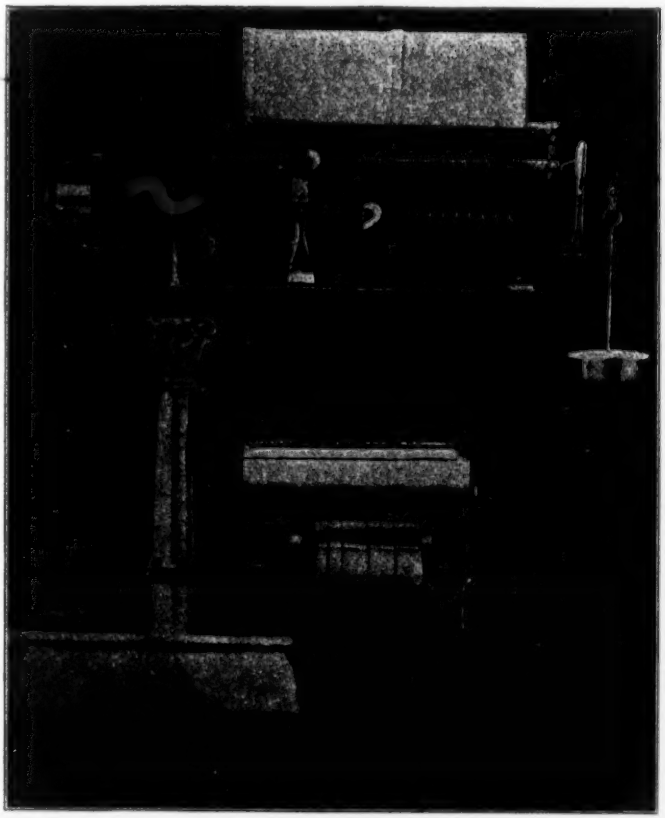
Title: Improvement in Weight and Price Indicating Scales.
5651/12 M. E. K. M. M. A.

(Endorsed) Filed Jun 13 7912 at ..... o'clock ....M. T. C. MacMillan Clerk.

DEFENDANT'S EXHIBIT WISE PHOTOGRAPH.



DEFENDANT'S EXHIBIT PHOTOGRAPH OF MILBURN SCALE.



The Computing Scale Company
v
Toledo Computing Scale Company

DEFTS EXHIBIT—E. R. CROSS LETTER

ALBERT GARCEAU
(Seal) *Notary Public*

March 16 1912
E. Canby, President. Capital, $160,000.00
O. O. Ozias, General Manager.
The Computing Scale Company.
Dayton, O. October 31st, 1891.

E. R. Cross,
1929-S-6th-St. Philadelphia, Pa.,

DEAR SIR:—

We are in receipt of your favor of the 27th. and in reply you may come at once and begin work on the terms named in your letter, we presume you can come some time next week, and will arrange to have work for you as soon as you arrive.

Respectfully,
THE COMPUTING SCALE CO.

(Endorsed) Filed Jun 13 1912 At ..... O'clock .....M.
T. C. MacMillan Clerk

Computing Scale Co.
vs.
Toledo Computing Scale Co. } 30024.

DEFENDANT'S EXHIBIT, "TELEGRAMS TO AND FROM MRS. WISE"

SOLON T. KLATZ
Notary Public.

Form 2289

Night Letter
The Western Union Telegraph Company
Incorporated
25,000 offices in America — Cable service to all the world
Robert C. Clowry, President. — Belvidere Brooks, General Manager

(Printed form 2289 Night Letter of The Western Union Telegraph Company not copied.)

Copy. 50
Feb. 3, 1912.

Mrs. Margaret A. Wise
239 So Hill St Los Angeles Cal.

There was a scale model made by Gardam & Sons as shown in British patent. We have testimony from four parties who saw it. Can you recall if model was ever shipped west from Erie or was it destroyed here. Wire Burkholder Erie Club, Erie, Penna night letter my expense.

TOLEDO COMPUTING SCALE CO.

(Endorsed) Filed June 13, 1912, T. C. MacMillan, Clerk.
Form 2589 B.

Day Letter.
Western Union Telegraph Company
Incorporated
25,000 offices in America Cable service to all the world.
(Here follows printed matter not copied.)
Theo. N. Vail, President. Belvidere Brooks, General Manager.
Received at $1.45 Chg.
4.....w.....35 Collect, 4 ex Blue, 45 & $1.
Losangeles Calif Feb 4 via Erie Pa 5-12
Mr. Burkholder,
Toledo Computing Scale Co.
Toledo Pat Dpt.,
One British patent with scale model was sold to an englishman, my attorney has been trying to locate him, he may have the model in question, I am not sure.

MARQARET WISE
1033A

The Western Union Telegraph Company
Incorporated
25,000 offices in America. Cable service to all the world.
Robert C. Lowry President and General Manager.
(Printed form of The Western Union Telegraph Company not copied.)

Feb. 5, 1912.

Mrs Margaret Wise
239 So Hill St Los Angeles Cal
About when was scale model and patent sold to Englishman

J. D. BURKHOLDER
☞Read the notice and agreement on back.

Form 2289

Night Letter
The Western Union Telegraph Company
Incorporated
25,000 offices in America Cable services to all the world
Theo. N. Vail, President — Belvidere Brooks, General Manager
(Here follows printed matter not copied.)
Received at 9 CH MA —11 Collect NL"— 1.00 Chg.

738
Los Angeles, Calif Feb 5, 12

J. D Burkholder,
Tolodo Computing Scale Co. Toledo, Ohio
Think patent and model sold englishman about thirteen years ago

MARGARETE WISE
1236 A Feb 6, 12

(Endorsed) Filed June 13, 1912, T. C. MacMillan, Clerk.

1912. And on to-wit: the twenty-fifth day of June, being one of the days of the June 1912, term of said Court, in the record of proceedings thereof in said entitled cause before the Hon. Kenesaw M. Landis, Judge of said Court, appears the following entry to-wit:

The Computing Scale Company,
vs.
Toledo Computing Scale Company. } 30024.

This cause having come on to be heard on the pleadings and proofs, and having been argued by counsel for the respective parties and taken under advisement, and the Court having duly considered the same and being now fully advised in the premises, it is

Ordered, Adjudged And Decreed as follows:

I.

That reissued Letters Patent No. 11,536 granted April 28, 1896, to Albert U. Smith and Edmond C. Smith upon the application of Albert U. Smith, as assignee of an undivided one-half interest to Edmond C. Smith, and Letters Patent

No. 597,300 granted January 11, 1898, to The E. C. Smith Company, upon the application of and as assignee of Albert U. Smith, are good and valid in law.

II.

That the complainant, The Computing Scale Company, is the sole and exclusive owner of both of said Letters Patent and of the inventions described and claimed therein, and of all rights and privileges of whatsoever nature thereunder and thereto.

III.

That the defendant, Toledo Computing Scale Company, has a regular and established place of business in this District at Chicago, Illinois, and has there and elsewhere infringed both of said Letters Patent, and particularly claims five and six of said reissued Letters Patent No. 11,536, and claim two of Letters Patent No. 597,300, and each of said claims.

IV.

That the complainant do recover of the defendant the profits, gains, and advantages which the defendant has derived, received or made, or shall have derived, received, or made, by reason of its said infringement of said Letters Patent, and that the complainant do also recover of the defendant any and all damages which the complainant has sustained, or shall sustain, by reason of said infringement of said Letters Patent by defendant.

V.

That this cause be and is hereby referred to Charles B. Morrison a Master of this Court, to take and state an account of said profits, gains and advantages, and to assess such damages, and to report thereon to the Court with all convenient speed; and that the defendant and its attorneys, officers, agents, clerks, servants, and workmen be and they are hereby directed and required to attend before said Master, from time to time as he shall direct, and produce before him all such books, papers, vouchers, and documents, and submit to such oral examination as he may direct and require.

VI.

That a perpetual injunction issue out of and under the seal of this Court, directed to the defendant, Toledo Computing Scale Company, and enjoining it and its officers, agents, attorneys and workmen, and each of them, from making using or vending, or causing to be made, used or vended the invention and improvement described and claimed in the aforesaid claims, numbers five and six of reissued Letters Patent No. 11,536, and claim two of Letters Patent No. 597,300, or any of them, and from making, using or vending to others to be used, or in any manner disposing of any scales made in accordance with said claims of said Letters Patent, or any of them, or like or similar to the scales which the said defendant has heretofore made, used or vended to others to be used, in infringement of said Letters Patent, and each of them.

VII.

That the complainant do recover of the defendant its costs and disbursements of this suit, to be taxed, and have execution against the defendant therefor.

KENESAW M. LANDIS,
U. S. District Judge.

And on to-wit: the twenty-fifth day of June, 1912, come the defendant in said entitled cause by its solicitor and filed in the Clerk's office of said Court its certain Petition for Appeal and Assignment of Errors in words and figures following to-wit:

PETITION FOR APPEAL AND ASSIGNMENT OF ERRORS.

Filed

IN THE UNITED STATES DISTRICT COURT

Northern District of Illinois,

Eastern Division.

The Computing Scale Company, *Complainant,*
vs.
Toledo Computing Scale Company, *Defendant.*
In Equity. No. 30024.

PETITION FOR APPEAL.

The above named defendant, Toledo Computing Scale Company conceiving itself aggrived by the decree made and entered in the above entitled cause on the 24th day of June, 1912, does hereby appeal from said decree to the United States Circuit Court of Appeals for the Seventh Circuit, for the reasons specified in the assignment of errors which is filed herewith, and prays that its appeal may be allowed and a citation issued directed to the above named complainant, commanding it to appear before the United States Circuit Court of Appeals for the Seventh Circuit, to do and receive what may appertain to justice to be done in the premises, and that a transcript of the record, proceedings and papers in said cause upon which said decree was made, duly authenticated, may be sent to the United States Circuit Court of Appeals for the Seventh Circuit.

RECTOR, HIBBEN, DAVIS & MACAULEY,
Solicitors for Defendant,

The foregoing appeal is allowed upon the defendant filing a bond in the sum of five hundred dollars, to be approved by the Court, to secure the complainant's costs upon said appeal.

KENESAW M. LANDIS,
United States District Judge.

O. K. as to form.
W. A. SCOTT.

25. IN THE UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company, *Complainant,*
vs.
Toledo Computing Scale Company, *Defendant.*
} In Equity. No. 30024.

ASSIGNMENT OF ERRORS.

And now comes the defendant, Toledo Computing Scale Company, by its solicitors, and presents with the accompanying petition for appeal from the decree entered in this cause on the 24th day of June, 1912, the following assignment of errors:

First: That the court erred in decreeing that the letters patent in suit in this cause, to-wit: reissued letters patent of the United States No. 11,536, granted April 28, 1896, to Albert U. Smith and Edmond C. Smith, and original letters patent of the United States No. 597,300, granted January 11, 1898, to The E. C. Smith Company, are good and valid in law.

Second: That the Court erred in decreeing that the complainant, The Computing Scale Company, is the sole and exclusive owner of said letters patent, and each of them, and of the inventions described and claimed therein, and of all rights and privileges of whatsoever nature thereunder and thereto.

Third: That the Court erred in decreeing that the defendant, Toledo Computing Scale Company, has infringed said letters patent, and each of them, and particularly claims 5 and 6 of said reissued letters patent No. 11,536, and claim 2 of letters patent No. 597,300, and each of said claims.

Fourth: That the court erred in not decreeing that claim 5 of said reissued letters patent No. 11536 is invalid in law and void.

Fifth: That the court erred in not decreeing that claim 6 of said reissued letters patent No. 11,536 is invalid in law and void.

Sixth: That the court erred in not decreeing that claim 2 of said letters patent No. 597,300 is invalid in law and void.

Seventh: That the Court erred in decreeing that the defendant, Toledo Computing Scale Company, has infringed either of the aforesaid claims of the letters patent in suit to-wit claims 5 and 6 of said reissued letters patent No. 11,536 and claim 2 of letters patent No. 597,300, and in not finding and holding that the defendant has infringed no one of said claims.

Eighth: That the court erred in decreeing that the complainant should recover of the defendant the profits, gains and advantages which the defendant has derived, received or made, or shall have derived, received or made by reason of its alleged infringement of the said letters patent in suit, and in decreeing that the complainant should also recover of the defendant any and all damages which the complainant has sustained by reason of said alleged infringement of said letters patent by defendant.

Ninth: That the court erred in referring said cause to a master of this court, to take and state an account of said profits, gains and advantages, and to assess such damages, and to report thereon to the court, in requiring the defendant and its attorneys, officers, agents, clerks, servants and workmen to attend before said master, and to produce before him all such books, papers, vouchers, and documents and to submit to such oral examination as he may direct and require.

Tenth: That the court erred in decreeing that a perpetual injunction issue against the defendant, Toledo Computing Scale Company, enjoining it and its officers, agents, attorneys, and workmen, and each of them, from making, using or vending, or causing to be made, used or vended, the alleged invention and improvement described and claimed in the aforesaid claims, numbers 5 and 6, of said reissued letters patent No. 11,536, and claim 2 of said letters patent No. 597,300 or any of them, and from making, using or vending to others to be used, or in any manner disposing of any scales made in accordance with said claims of said letters patent, or any of them, or like or similar to the scales which the said defendant has heretofore made, used or vended to others to be used, in alleged infringement of said letters patent.

Eleventh: That the court erred in awarding any injunction against the defendant.

Twelfth: That the Court erred in decreeing that the scales embodying the alleged inventions and improvements described in claims 5 and 6 of said reissued letters patent No. 11,536 and claim 2 of said letters patent No. 597,300, or any part thereof, now in the possession of the defendant, its agents and servants, be destroyed, or delivered up to the complainant for that purpose.

Thirteenth: That the Court erred in decreeing that the complainant recover of the defendant its costs and disbursements of this suit, to be taxed, and have execution against the defendant therefor.

Fourteenth: That the Court erred in not dismissing the bill of complaint.

RECTOR, HIBBEN, DAVIS & MACAULEY,
Solicitors for Defendant.

(Endorsed) Filed June 25, 1912, T. C. MacMillan, Clerk.

912. And on the same day to-wit: the twenty-fifth day of June, being one of the days of the June 1912, term of said Court, in the record of proceedings thereof in said entitled cause before the Hon. Kenesaw M. Landis, Judge of said Court, appears the following entry to-wit:

The Computing Scale Company,
vs.
Toledo Computing Scale Company. } 30,024.

Now comes the defendant by its solicitors and presents to the Court its petition for appeal and assignment of errors and moves the Court for the allowance of an appeal to the United States Circuit Court of Appeals for the Seventh Circuit.

It is thereupon ordered by the Court that said appeal be allowed upon the defendant filing a bond in the sum of Five Hundred Dollars ($500.00) with security to be approved by the Court.

And on the same day to-wit: the twenty-fifth day of June, 1912, come the Toledo Computing Scale Company and filed in the Clerk's office of said Court in said entitled cause a certain Appeal Bond in words and figures following to-wit:

APPEAL BOND.

Filed 12[illegible]

IN THE UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company, *Complainant,*
vs.
Toledo Computing Scale Company, *Defendant.*
} In Equity. No. 30024.

Appeal Bond.

Know all men by these presents, that we, Toledo Computing Scale Company, as principal, and National Surety Company, as surety, are held and firmly bound unto The Computing Scale Company, in the full and just sum of five hundred dollars ($500.00) to be paid to the said The Computing Scale Company, its executors or assigns; to which payment, well and truly to be made, we bind ourselves, our heirs, executors and administrators, jointly and severally, firmly by these presents. Sealed with our seals and dated this 22nd day of June, in the year of our Lord one thousand nine hundred and twelve.

Whereas, lately at a session of the United States District Court for the Eastern Division of the Northern District of Illinois, in a suit pending in said Court between the said The Computing Scale Company, complainant, and Toledo Computing Scale Company, defendant, a decree was entered in favor of said Complainant, and

Whereas, the said Toledo Computing Scale Company, defendant is about to obtain an order allowing an appeal from said decree to the United States Circuit Court of Appeals for the Seventh Circuit, to reverse the said decree, and a citation directed to the said The Computing Scale Company, citing and admonishing it to be and appear in the United States Circuit Court of Appeals for the Seventh Circuit, to be holden at Chicago within thirty (30) days from the date thereof.

Now, the condition of the above obligation is such, that if the said Toledo Computing Scale Company shall prosecute its appeal to that effect, and shall answer all costs and damages that may be awarded against it if it fails to make its plea good, then the above obligation to be void; otherwise to remain in full force and effect.

TOLEDO COMPUTING SCALE COMPANY,
By HENRY THEOBALD,
(Seal) *President.*

NATIONAL SURETY COMPANY,
By CHAS. H. BURRAS,
(Seal) *Resident Vice President.*

Attest:
T. J. LORANGER, (Seal)
Resident Assistant Secretary.

Approved June 24, 1912.

KENESAW M. LANDIS,
Judge.

O. K. as to form.
W. A. SCOTT.

(Endorsed) Filed June 25, 1912, T. C. MacMillan, Clerk.

And on the same day to-wit: the twenty-fifth day of June, 1912, come the Toledo Computing Scale Company by its solicitor and filed in the clerk's office of said Court a certain petition and Notice in words and figures following to-wit:

PETITION AND NOTICE.

Filed 19

IN THE UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company, *Complainant,*
vs.
Toledo Computing Scale Company, *Defendant.*
} In Equity. No. 30024.

Petition.

Te tho Honorable the Judges of the United States District Court for the Eastern Division of the Northern District of Illinois:

Your petitioner, Toledo Computing Scale Company, defendant in the above entitled cause, respectfully represents and shows:

That it is now and for more than ten years past has been engaged in the manufacture of computing scales at Toledo, Ohio, and in the sale of the same throughout the United States and various foreign countries. That it has upwards of one million dollars invested in its business, and net assets, over and above all liabilities, exceeding three quarters of a million dollars. That it has approximately four hundred employees in its factory at Toledo, and has upwards of sixty agencies in various parts of the country for the sale of its scales, with more than two hundred and fifty salesmen devoting their time exclusively to the sale thereof.

That it began the manufacture and sale of the scales complained of in this case in the year 1906, and has continuously carried on their manufacture and sale in annually increasing numbers since said date, and that at the present time the manufacture and sale of said scales constitutes more than one-half of its entire business. That they have been sold and are now in use in every state and territory in the United States, and that more than a thousand of said scales are in

the hands of its agencies and salesmen throughout the country at the present time.

Your petitioner further represents and shows that soon after it began to place said scales extensively upon the market, to wit, in the month of March of the year 1907, the complainant in this cause began two separate suits against your petitioner, in the United States Circuit Court at Toledo, Ohio, for alleged infringement of the same patents involved in this case, to wit, reissued letters patent No. 11,536, and original letters patent No. 597,300. That your petitioner promptly filed its answers in said suits on May 6, 1907, and that said suits were put at issue by the filing of replications on June 3, 1907. That the complainant extensively advertised said suits throughout the United States, in the trade papers and by circulars and letters sent to thousands of purchasers and prospective purchasers of your petitioner's scales, but took no steps whatever toward prosecuting said suits or enforcing its alleged rights thereunder. That it never did make any move whatever toward the prosecution of said suits, but after they had been pending more than three years, to wit, on May 23, 1910, it brought the present suit against your petitioner, in this jurisdiction, for alleged infringement of the same patents. That your petitioner promptly filed its answer to the present suit, and that said suit was put at issue by the filing of a replication on or about August 29, 1910, but that complainant took no steps whatever toward the prosecution of said suit, until the following March, towit, on or about March 15, 1911, when it applied to his Honor, Judge Kohlsaat, for an extension of time for the introduction of proofs. That your petitioner opposed said application, upon the ground that complainant then had tyo suits against your petitioner at Toledo for infringement of the same patents, which it had allowed to remain unprosecuted for more than four years, and that it had delayed the introduction of proofs in the suit in this jurisdiction for more than six months after said suit had been at issue; and that your petitioner therefore believed that said suits had not been brought in good faith or under the belief that said patents were valid and had been infringed by your petitioner, but had been brought and had been used solely for advertising and commercial purposes. That his Honor, Judge Kohlsaat, nevertheless granted said application, upon the condition that complainant forthwith dismiss its aforesaid pending suits at Toledo, and close its opening proofs in the suit in this juris-

diction within thirty days, whereupon said two suit at Toledo, which had been pending unprosecuted for more than four years, were dismissed, and the prosecution of the suit in this jurisdiction begun.

Your petitioner further represents and shows that if said letters patent are valid and are infringed by your petitioner's scales, complainant made no effort whatsoever to enforce its rights thereunder against your petitioner for more than five years after your petitioner began the manufacture and sale of its scales complained of in this suit, and that during said period your petitioner, being advised and believing that it was not violating any lawful rights of complainant by the manufacture and sale of said scales, proceeded to and did invest a very large sum of money, towit, more than a quarter of a million of dollars, in equipment for the manufacture and sale of said scales and in facilities for their distribution and sale, and has during said period built up a large and valuable business in the manufacture and sale of said scales, and that the manufacture and sale of said scales now constitutes an essential and vital part of defendant's business as a going concern.

Your petitioner further represents and shows that the reissued letters patent in suit in this cause expire by limitation on September 3, 1912, less than three months hence, so that the complainant, by its aforesaid conduct, has voluntarily allowed almost the entire term of said letters patent to expire without making any bona fide effort to assert and enforce its alleged rights thereunder.

Your petitioner further represents and shows that it is advised and believes that, notwithstanding the decree which has been awarded the complainant in this case, there is serious doubt respecting the validity of each of the two letters patent involved therein. That an appeal from said decree may be heard and determined at the October term, 1912, of the Court of Appeals for this circuit; that to allow the injunction against your petitioner, awarded by said decree, to go into force and effect, even until the expiration of the said reissued letters patent less than three months hence, would irreparably damage defendant's business as a going concern, without corresponding legitimate benefit to complainant; and that if said decree should be reversed by the Court of Appeals, and said letters patent were held invalid or not to be infringed by your petitioner's scales, your petitioner would be without a remedy in the premises, and would suffer very great permanent loss.

Wherefore, the premises considered, your petitioner respectfully prays that the injunction awarded against it by the decree in this cause may be suspended by an order of this court until a hearing and determination of your petitioner's appeal from said decree.

TOLEDO COMPUTING SCALE COMPANY,
By HENRY THEOBALD,
President.

RECTOR, HIBBEN, DAVIS & MACAULAY,
Solicitors and Counsel for Petitioner.

State of Illinois }
County of Cook } ss.

Before me, the undersigned, a Notary Public, in and for Cook County, Illinois, this 22nd day of June, 1912, personally appeared Henry Theobald, personally known to me to be the President of the Toledo Computing Scale Company, the petitioner named in the foregoing petition, and executed the same in my presence, and made oath that he had read the same, and knew the contents thereof, and that said petition was true.

ROBERT DOBBERMAN,
(Seal) *Notary Public, Cook County, Ills.*

IN THE UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company, *Complainant,*
vs.
Toledo Computing Scale Company, *Defendant.*
} In Equity. No. 30024.

NOTICE.

Messrs. Sheridan, Wilkerson, Scott & Richmond,
Solicitors for complainant.

Gentlemen:—

Please take notice that on Monday, June 24th, 1912, at ten o'clock A. M. or as soon thereafter as counsel can be heard, before the Honorable Kenesaw M. Landis, Judge of United States District Court for the Northern District of Illinois, we shall present to the Court the accompanying petition for a suspension of the injunction in said cause pending a hearing and determination of the appeal from the decree awarding said injunction.

RECTOR, HIBBEN, DAVIS & MACAULEY,
Solicitors for Defendant.

Received copies of the foregoing notice and of the Petition mentioned therein this 22nd day of June, 1912.

SHERIDAN, WILKERSON, SCOTT & RICHMOND,
Solicitors for Complainant.

(Endorsed) Filed Jun 25 1912. T. C. MacMillan, Clerk.

And on the same day to-wit: the twenty-fifth day of June, being one of the days of the June 1912, term of said Court, in the record of proceedings thereof in said entitled cause before the Hon. Kenesaw M. Landis, Judge of said Court, appears the following entry to-wit:

The Computing Scale Company, *Complainant,* *vs.* Toledo Computing Scale Company, *Defendant.*	30024.

This cause coming on to be heard on the petition of the defendant for an order suspending the injunction awarded to the complainant in the above entitled cause by the decree of this Court entered on June 24, 1912, pending a hearing and determination of defendant's appeal from said decree, and having been argued by counsel, and the court being fully advised in the premises, it is Ordered as follows:

1. That said petition be and the same is hereby granted, and that said injunction be and the same is hereby suspended pending a hearing and determination of defendant's appeal from said decree.

2. That the defendant file with the clerk of the Court a due and sufficient bond in the penal sum of twenty-five thousand dollars, to be approved by the Court, securing to the complainant all profits and damages which may ultimately be awarded to it in this cause on account of any further infringement of the letters patent in suit in this cause pending a hearing and determination of defendant's appeal from the aforesaid decree.

KENESAW M. LANDIS,
United States District Judge.

And on to-wit: the fifteenth day of July, 1912, there was filed in the Clerk's office of said Court in said entitled cause a certain Supersedeas Bond in words and figures following to-wit:

SUPERSEDEAS BOND.

IN THE UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company, *Complainant,* *vs.* Toledo Computing Scale Company, *Defendant.*	In Equity. No. 30024.

Bond.

Know all men by these presents, that we, Toledo Computing Scale Company, as principal, and Fidelity & Deposit Company of Maryland, as surety, are held and firmly bound unto The Computing Scale Company in the full and just sum of twenty-five thousand dollars to be paid to the said The Computing Scale Company, its successors and assigns, to which payment, well and truly to be made, we bind ourselves, our successors and assigns, jointly and severally, firmly by these presents. Sealed with our seals and dated this fifth day of July, in the year of our Lord one thousand nine hundred and twelve.

Whereas, lately at a session of the United States District Court for the Eastern Division of the Northern District of Illinois, in a suit pending in said Court between said The Computing Scale Company, complainant, and the said Toledo Computing Scale Company, defendant, a decree was entered in favor of said complainant awarding, among other things, an injunction against the said defendant restraining it from further alleged infringement of certain Letters Patent, and

Whereas, the said Toledo Computing Scale Company, defendant, has prayed and been allowed an appeal from said decree to the United States Circuit Court of Appeals for the Seventh Circuit, and

Whereas, by an order duly entered in said cause on the 25th day of June, 1912, a copy of which order is hereto at-

tached and made a part hereof, it was ordered and directed that the injunction awarded by said decree against the said defendant, Toledo Computing Scale Company, be suspended pending a hearing and determination of said defendant's appeal from said decree, and that the said defendant file with the Clerk of the Court a due and sufficient bond in the penal sum of twenty-five thousand dollars, securing to the said complainant, The Computing Scale Company, all profits and damages which may ultimately be awarded to it in said cause on account of any further infringement of the said Letters Patent by the said defendant pending a hearing and determination of said defendant's appeal from said decree.

Now, the condition of the above obligation is such, that if the said Toledo Computing Scale Company shall prosecute its said appeal to effect, and shall pay to the said The Computing Scale Company all profits and damages which may be awarded to said The Computing Scale Company on account of any further infringement of the said Letters Patent pending a hearing and determination of said appeal if it fails to make its plea good, then the above obligation to be void; otherwise to remain in full force and effect.

TOLEDO COMPUTING SCALE COMPANY,
By HENRY THEOBALD,
President.
(Seal)

FIDELITY AND DEPOSIT COMPANY OF MARYLAND,
By FRED A. PRICE,
Attorney in Fact,
(Seal)
WILLIAM G. KRESS,
Agent.

Attest:
D. H. KELLY,
Asst. Secy.

Appvd:
K. M. L.

State of Illinois } ss.
County of Cook }

I, A. C. Boule, a Notary Public in and for said County in the State aforesaid, do hereby certify that Fred A. Price, attorney in fact, and William G. Kress, agent of the Fidelity and Deposit Company of Maryland, who are personally known to me, appeared before me this day and acknowledged that

they signed, sealed and delivered the foregoing instrument as their free and voluntary act as attorney in fact, and agent of the Fidelity and Deposit Company of Maryland, and as the free and voluntary act of the Fidelity and Deposit Company of Maryland, for the uses and purposes therein set forth.

Given under my hand and Notarial seal this fifth day of July, A. D. 1912.

A. C. BOULE,
Notary Public.

(Seal)

IN THE UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company, *Complainant,*
vs.
Toledo Computing Scale Company, *Defendant.*
No. 30024.
In Equity.

ORDER.

This cause coming on to be heard on the petition of the defendant for an order suspending the injunction awarded to the complainant in the above entitled cause by the decree of this court entered on June 24, 1912, pending a hearing and determination of defendant's appeal from said decree, and having been argued by counsel, and the court being fully advised in the premises, it is Ordered as follows:

1. That said petition be and the same is hereby granted, and that said injunction be and the same is hereby suspended pending a hearing and determination of defendant's appeal from said decree.

2. That the defendant file with the clerk of the Court a due and sufficient bond in the penal sum of twenty-five thousand dollars, to be approved by the court, securing to the complainant all profits and damages which may ultimately be awarded to it in this cause on account of any further infringement of the letters patent in suit in this cause pending a hearing and determination of defendant's appeal from the aforesaid decree.

KENESAW M. LANDIS,
United States District Judge.

(Endorsed) Filed July 15, 1912, T. C. MacMillan, Clerk.

And on to-wit: the fifteenth day of July, 1912, there was filed in the Clerk's office of said Court in said entitled cause a certain Stipulation in words and figures following to-wit:

STIPULATION.

IN THE UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company, *vs.* Toledo Computing Scale Company. } In Equity. No. 30024.

Stipulation.

It is hereby stipulated and agreed by and between counsel for the respective parties to the above-entitled cause that the printed records therein, upon which the cause was argued and submitted in the District Court, may be certified by the Clerk of said Court to the Court of Appeals as a true and complete transcript of the pleadings and testimony in said cause, said printed record and said transcript being subject to correction by the original records if any material error shall be made to appear.

It is further stipulated and agreed that the following documentary exhibits may, because of the difficulty and impracticability of reproducing them, be omitted from the transcript to be sent to the Court of Appeals, and be certified and sent to the Court as original exhibits, to wit:

Defendant's Exhibit Netter Account Book; Defendant's Exhibit Culmer Sketch; Defendant's Exhibit Untreated Chart Sheet; Defendant's Exhibit Wise Photograph; Defendant's Exhibit Photograph of Milburn Scale; Defendant's Exhibit The Balance of 1894; Defendant's Exhibit The Balance of 1895; Defendant's Exhibit Milburn Number Strips; Defendant's Exhibit Computing Scale Company Publication #3; Defendant's Exhibit Milburn Envelope; Defendant's Exhibit Drawing of Milburn Scale; Defendant's Exhibit Milburn

Chart Sketch; Complainant's Exhibit Poole Sketch, and Complainant's Exhibit Sample Magazine Cover.

It is further stipulated and agreed that there may be omitted from the transcript of the record to be sent to the Court of Appeals on said appeal all drawings and photographs contained in the file wrappers and contents of the applications for patents which are in evidence in said cause, excepting the printed drawings and specifications of the patents themselves.

SHERIDAN, WILKERSON, SCOTT & RICHMOND,
Solicitors for complainant.

RECTOR, HIBBEN, DAVIS & MACAULEY,
Solicitors for defendant.

(Endorsed) Filed Jul 15, 1912. T. C. MacMillan, Clerk.

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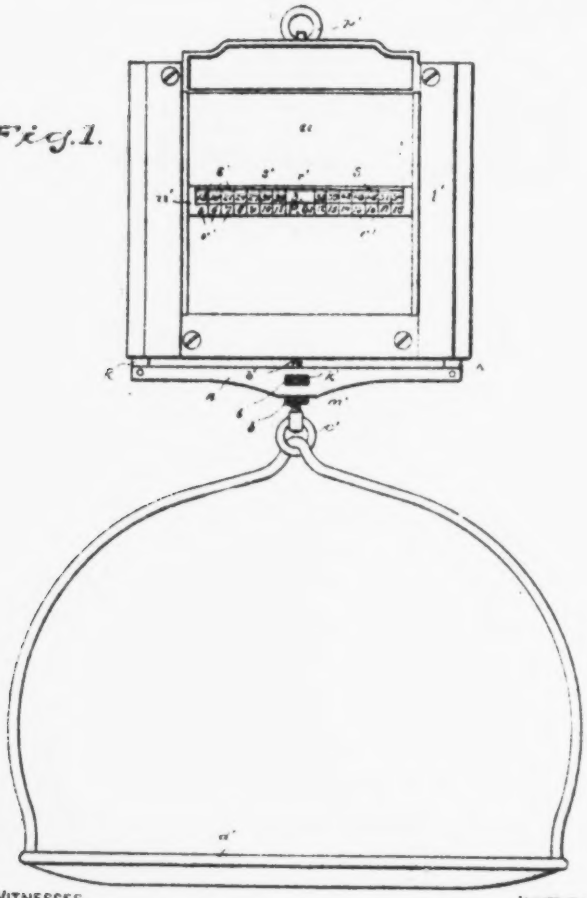
4 Sheets—Sheet 1.

A. U. SMITH.

AUTOMATIC COMPUTING SCALE.

No. 11,536 Reissued Apr. 28, 1896.

Fig. 1.



WITNESSES

H. A. Lamb

S. P. Richardson.

INVENTOR

Albert U. Smith

By A. W. Webster

Atty.

1169

661

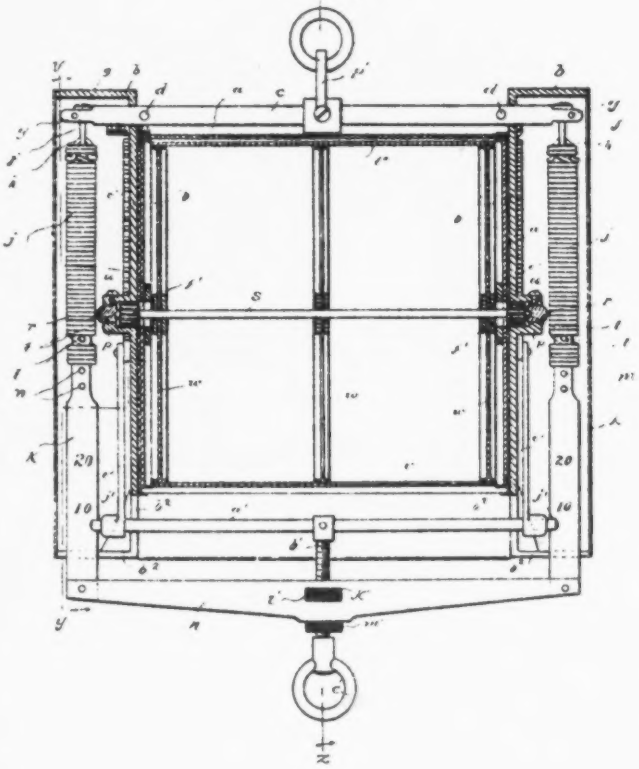
4 Sheets—Sheet 2.

A. U. SMITH.

AUTOMATIC COMPUTING SCALE.

No. 11,536. Reissued Apr. 28, 1896.

Fig. 2.



WITNESSES

H. A. Lamb

S. V. Richardson

INVENTOR

Albert U. Smith

By A. M. Booster

Atty.

1170

663 4 Sheets—Sheet 3.

A. U. SMITH.

AUTOMATIC COMPUTING SCALE.

No. 11,536. Reissued Apr. 28, 1896.

Fig. 3.

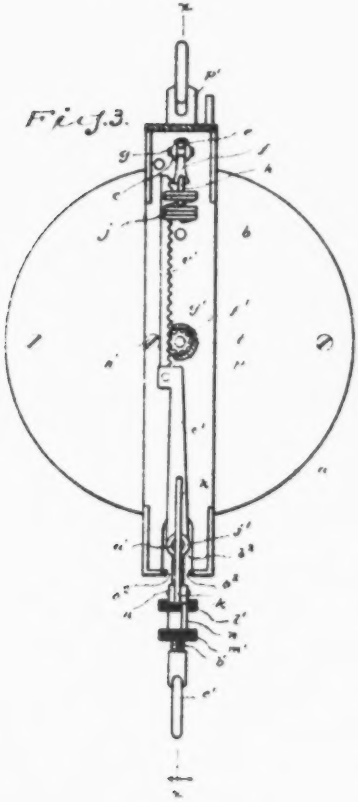
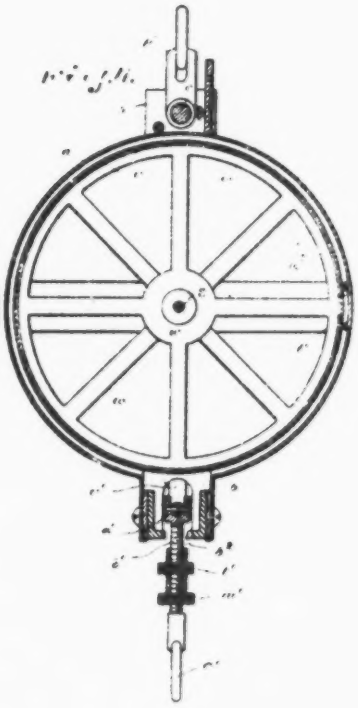


Fig. 4.



WITNESSES

H. H. Lamb

S. Richardson

INVENTOR

Albert U. Smith

By C. A. Wooster Atty

1171

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4 Sheets—Sheet 4

A. U. SMITH.

AUTOMATIC COMPUTING SCALE.

No. 11,536. Reissued Apr. 28, 1896.

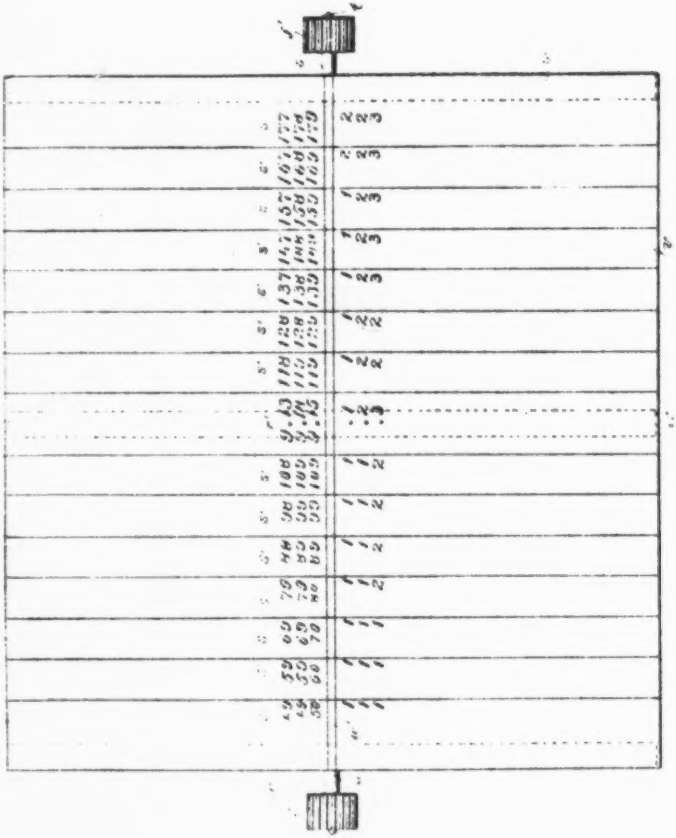


Fig. 5.

WITNESSES

H. A. Lamb

J. J. Richardson

INVENTOR

Albert U. Smith

By A. M. Wooster Atty.

UNITED STATES PATENT OFFICE.

ALBERT U. SMITH, OF SEYMOUR, CONNECTICUT, ASSIGNOR OF ONE-HALF TO EDMOND C. SMITH, OF WESTPORT, CONNECTICUT

AUTOMATIC COMPUTING-SCALE.

SPECIFICATION forming part of Reissued Letters Patent No. 11,586, dated April 28, 1896.

Original No. 545,616, dated September 3, 1895. Application for reissue filed January 27, 1896. Serial No. 577,074.

To all whom it may concern:

Be it known that I, ALBERT U. SMITH, a citizen of the United States, residing at Seymour, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Automatic Computing-Scales; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to certain new and useful improvements in weighing-scales whereon the weight and selling-price of a commodity may be ascertained at a glance without any mental calculation on the part of the person using the same, but particularly resides in the details of construction and combination of elements, as will be fully hereinafter described, and specifically pointed out in the claims.

The object of my invention is to provide scales of this description which shall be extraordinarily sensitive to weights of small amount and to accurately register the same.

A further object of my invention is to provide an adjusting mechanism by the use of which the springs employed may at all times be held at a uniform tension, or, in other words, when said springs have become weakened or distorted by long usage the adjusting mechanism may be employed to restore a proper tension to said springs; also, said adjusting mechanism may be used to set the scales at a "balance" after the weighing-pan is suspended therefrom, and the difference in weight of various kinds of weighing-pans may be compensated for by the use of this mechanism.

In the accompanying drawings, Figure 1 is a front elevation showing a weighing-pan suspended from the scales; Fig. 2, a section at the line *x x* of Fig. 3; Fig. 3, a section on the line *y y* of Fig. 2; Fig. 4, a section on the line *z z* of Fig. 2, and Fig. 5 a detail elevation of the indicator-drum.

Similar letters of reference indicate like parts in the several figures of the drawings.

a is the casing, on opposite sides of which are rigidly secured uprights *b*.

c is a cross-bar loosely journaled in the uprights *b* above the top of the casing, but held as against lengthwise movement by pins *d*, which pass through said bar. The ends of the cross-bar *c* are notched, as shown at *e* in Fig. 3, and the headed draft-pins *f* are loosely held within these notches by keeper-pins *g*. The said draft-pins have secured loosely in their lower ends bow-shaped clips *h*, the ends of which are inserted between the coils of the springs *j*.

k are draft-rods, the upper ends of which are connected to the lower coils of the springs *j* by means of clips *l*, similar to the clips *h*, which are pivotally connected to the rods *k* by simply inserting said clips through perforations *m* in said rods. Each of the rods *k* has a series of these perforations *m*, so that a greater or lesser length of spring may be used, as the exigencies of the case require. The lower ends of the draft-rods are pivotally connected by a yoke *n*.

p are hollow bosses formed integral with the uprights *b*, within the outer extremities of which are adjustable bearings *r* for the shaft *s*. The ends of the shaft *s* are formed into cone-journals *t*, and the bearings *r* for this shaft are correspondingly shaped. *u* are set-screws for holding said bearings in place after a proper adjustment has been made.

v is an indicator-drum which is rigidly secured to the shaft *s*. It is a very essential feature that the indicator-drum in scales of this nature should be made of very light material, for the reason that if it be not so made the sensitiveness and accuracy of the scales will be more or less affected. For instance, heretofore in scales of this character if a given quantity is weighed successively a number of times it will be found that said scales scarcely ever indicate the weight of such quantity twice exactly the same, there always being some slight variation in the amount registered. This is in a great measure due to the fact that the more the actual weight of the indicator-drum itself the greater must be the force necessary to operate it, and in order to overcome this disadvantage I have constructed the drum of this skeleton frames *w*

of aluminium, while the periphery is formed of a thin sheet of paper pasted to the frames. In this way I have secured a structure that is so light that the force necessary to operate it is almost insignificant.

a is a cross-rod, to which is secured a screw *b'*. The screw *b'* passes loosely through the yoke *n*, as shown at Fig. 4, and has within its lower end a ring *c'*, from which the scale-pan *d'* is suspended.

Pivoted to the cross-bar *a'* are rack-bars *e'*, which engage pinions *f'*, rigid with the shaft *n*. The hollow bosses *p* are at one side slotted or cut away, as shown at *g'* in Fig. 3, so that the rack-bars may be permitted to engage the pinions *f'*.

k' are keepers (but one shown) which insure the engagement of the rack-bars and pinions.

The ends of the cross-rod *a'* are notched, as shown at *j'*, and said ends embrace the edges of the draft-rods *k* in such manner as to be capable of sliding thereon.

k' is a slot in the yoke *n*, and within this slot is an adjusting-nut *l'*, which takes on the thread of the screw *b'*. *m'* is a set-screw on the lower portion of said screw. By revolving the nut *l'* the cross-rod *a'*, to which the screw *b* is connected, will be caused to move up or down, as the case may be, carrying with it the rack-bars *e'*, which will, through the pinions *f'*, effect the rotation of the indicator-drum as may be desired. Thus, should the scales when at rest indicate anything other than a perfect balance or zero, by turning the nuts *l' m'* the drum may be brought into proper relative position and there secured without disturbing the tension of the springs *j*. Should it be found necessary to increase or diminish the tension of the springs *j*, this may be easily effected by advancing the clips *h* along the coils of said springs after the manner of advancing a nut along a screw-thread. The lower portions of the uprights *b* are formed into guideways *b'*, through which the ends of the cross-rod *a'* and said draft-rods *k* pass, so that said rods will be properly guided in their movements.

The cross-bar *c* is provided with a ring-clip *p'*, by means of which the scales may be suspended from any suitable support.

Around the periphery of the drum *v*, at the central portion of the same, is a scale *r'*, see Figs. 1 and 5, indicating pounds and ounces. *s* are columns of figures parallel with the scale *r* and arranged in alinement therewith, which indicate the total amount in money for which a commodity should be sold after it has been weighed.

t is an opening in the face of the casing *a*, within which is fitted a glass *u'*, through which may be seen the figures on the periphery of the drum. The glass *u'* has printed or suitably inscribed thereon a series of figures *v'*, which register with the columns of figures *s'* and indicate various prices per pound.

The central portion of the glass has marked thereon the abbreviations "P." and "Oz.," and the scale *r'* on the periphery of the drum is adapted to register with these characters. Supposing that some article which weighs exactly three pounds has been placed in the weighing-pan of the scales, the indicator-drum will be brought to a position where the figure "3" in the column of pounds on the scale of the drum will be disclosed to view, as shown in Fig. 1. Supposing also that the price of such article is eight cents per pound, the operator will consult the series of figures on the glass until the number "8" is reached, when immediately above it will appear the total value of the article—*i. e.*, "24."

In Fig. 5 I have shown a detail view of the face of the drum, whereon the figures are inscribed, and the broad straight line *w'* shown in this figure is intended to show through the glass *u'* when the scales are at rest and at a balance or zero.

I am aware that computing scales have heretofore been constructed wherein a drum or cylinder is employed having the divisions of the weight-scale and other figures on its periphery, whereby the total selling-price of an article may be determined without mental calculation on the part of the operator, and I am also aware that said drum has been operated by a rack-bar and pinion, and I therefore do not broadly make any claim to these features; but

What I do claim, and desire to secure by Letters Patent, is—

1. The combination of the casing *a* the uprights *b* rigid with the sides thereof, the cross-bar *c*, the draft-rods *k* connected at their lower ends by a yoke *n*, the springs interposed between said draft-rods and cross-bar in the manner specified, the indicator-drum journaled within the uprights and carrying pinions which are engaged by rack-bars, the cross-rod *a'* to which the lower ends of the rack-bars are connected, the screw *b'* depending from the cross-rod and passing through the yoke *n*, and the set-nuts on said screw, substantially as and for the purpose set forth.

2. The combination of the indicator drum constructed of thin skeleton frames of a very light material, the periphery of said drum being formed of a sheet of paper having the divisions of the weight-scale and other numerals printed thereon, the pinions carried by the shaft of said drum, adjustable conical bearings wherein said shaft is journaled, the cross-bar *c* having a suspending clip secured thereon, the headed draft-pins supported loosely within the notched ends of the cross-bar *c* after the manner of a stirrup connection, the bow-shaped clips in the ends of the draft pins, the springs between the coils of which said clips are inserted, whereby the tension on said springs may be altered as described, the draft-rods *k*, the yoke *n* whereby said rods are connected, the cross-rod *a'* to which the rack-bars are pivoted and whose ends are notched and embrace said draft-rods

so as to be capable of sliding thereon, a ring from which the scale-pan is suspended, and suitable adjusting connections between the yoke *n* and said cross-rod *a'*, substantially as described.

3. The combination of the casing *a*, the uprights *b* rigid with the sides thereof, the cross-bar *c*, the draft-rods *k* connected at their lower ends by a yoke *n*, the springs interposed between said draft-rods and cross-bar, the indicator-drum journaled within the uprights and carrying pinions, the rack-bars engaging with said pinions, the cross-rod *a'* to which the lower ends of the rack-bars are connected, and the pin *b'* pivoted to said cross-rod and rigidly connected with the yoke *n* as to vertical movement and provided with means whereby a scale-pan may be attached, substantially as set forth.

4. The combination of the cross-rod *a'*, the springs connected at their upper extremities to a stationary part of the scale, the draft-rods suspended from the lower extremities of said springs, the yoke connecting the lower ends of said draft-rods, the pin *b'* pivoted to the cross-rod *a'* and depending therefrom and provided at its lower extremity with means for attaching a scale-pan said pan being rigidly connected with the yoke *n* as to vertical movement the oratory weight-indicating device, and means carried by the cross-rod *a'* for operating said device, substantially as set forth.

5. An indicator-drum for weighing mechanism, consisting of a spindle provided with a plurality of skeleton frames of light material and secured to said spindle, and having secured to their peripheries a sheet of paper forming a cylinder.

6. An indicator-drum for weighing mechanism consisting of a spindle provided with a plurality of skeleton disks or frames of thin aluminium having a sheet of paper extending around and secured to their peripheries to form a cylinder.

7. The combination with balance-springs and a draft-rod of a weighing apparatus, of a rack operated by said rod, and an indicator-drum consisting of a spindle provided with a pinion engaging said rack, skeleton disks or frames of light material secured to said spindle and a sheet of paper extending around and secured to the peripheries of the disks to form a cylinder.

In testimony whereof I affix my signature in presence of two witnesses.

ALBERT U. SMITH.

Witnesses:
A. M. WOOSTER,
S. V. RICHARDSON.

1175

(No Model.) 671 2 Sheets—Sheet 1

A. U. SMITH.

PRICE SCALE.

No. 597,300. Patented Jan. 11, 1898.

Fig. 1.

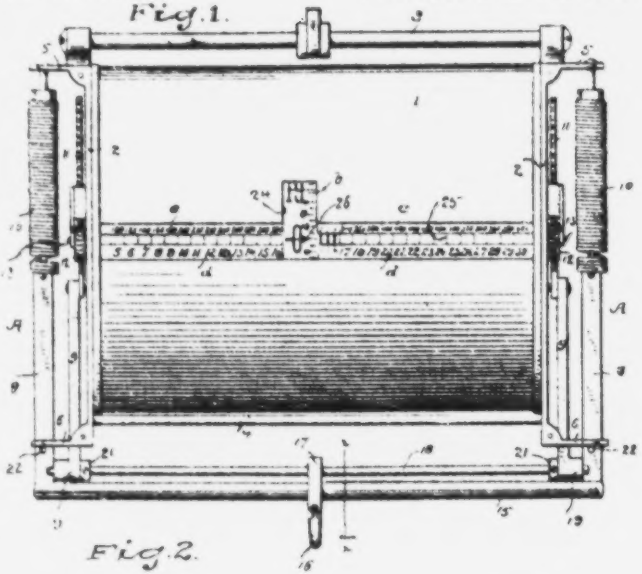
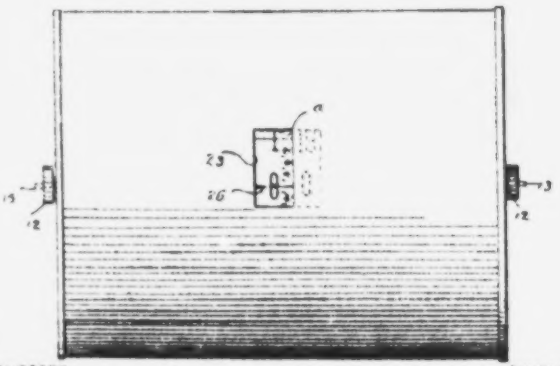


Fig. 2.



WITNESSES

H. A. Lamb

S. V. Haley

INVENTOR

Albert U. Smith

By A. Wilkinson Co.

1176

673

(No Model.) 2 Sheets—Sheet 2

A. U. SMITH.

PRICE SCALE.

No. 597,300. Patented Jan. 11, 1898.

Fig. 3.

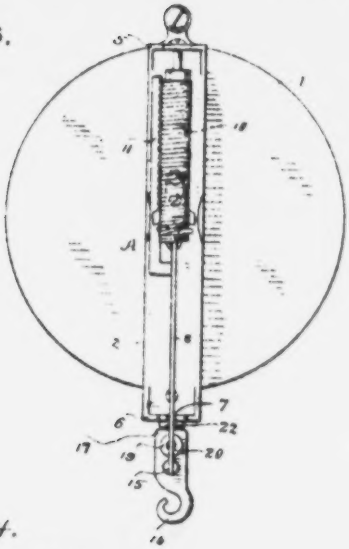
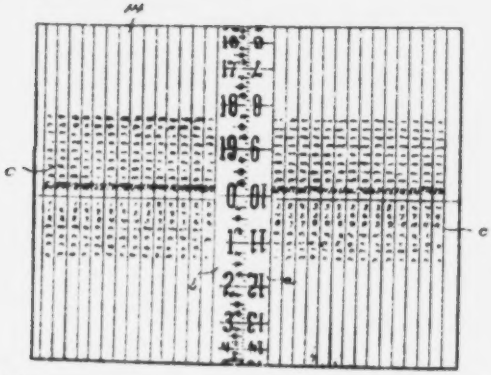


Fig. 5.

Fig. 4.



WITNESSES

H. A. Lamb

S. V. Foley

INVENTOR

Albert U. Smith

By A. Wilbroster City

1177

675

UNITED STATES PATENT OFFICE.

ALBERT U. SMITH, OF SAUGATUCK, CONNECTICUT, ASSIGNOR TO THE E. C. SMITH COMPANY, OF SAME PLACE

PRICE-SCALE.

SPECIFICATION forming part of Letters Patent No. 597,300, dated January 11, 1898.

Application filed July 30, 1897. Serial No. 646,491. (No model.)

To all whom it may concern:

Be it known that I, ALBERT U. SMITH, a citizen of the United States, residing at Saugatuck, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Price-Scales; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to an improvement upon the type of scales which automatically compute and indicate both the weight of the merchandise that may be placed in the weighing-pan and the amount to be charged therefor, my improvement being a carrying forward of the principles of operation illustrated and described in my former Letters Patent, reissued April 28, 1896, No. 11,526.

As scales of this class have heretofore been constructed in order to enable the purchaser to read the figures upon the drum which indicate the weight of the merchandise in the weighing-pan it has been necessary for him to stand upon the same side of the scale as the dealer, which is of course inconvenient—as, for example, if the scale is used over a counter or table—or else it has been necessary to turn the scale half-way around to enable the purchaser to read the figures.

The object of my present invention, therefore, is to combine with scales of the type referred to certain improvements which will cause the weight of the merchandise in the weighing-pan to be indicated by both sides of the drum and to appear simultaneously on opposite sides of the scale, and, furthermore, to combine with scales of this type certain improvements in the details of construction which will compensate for any uneven stretching of the springs and will render cramping of the parts in use practically impossible, and, furthermore, to combine with scales of this type certain improvements in the details of construction which will limit the upward movement of the draft and rack bars, and thereby stop backward rotation of the drum, but without imparting any appreciable shock to the drum.

With these ends in view my present invention consists in the construction and combination of parts, as hereinafter fully described, and then specifically pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a front elevation of my novel scale; Fig. 2, a rear elevation of the casing detached; Fig. 3, an end elevation as seen from the left in Fig. 1; Fig. 4, an elevation of the drum detached, and Fig. 5 is a section on the line *x x* in Fig. 1.

1 denotes the casing, which is secured in a suitable frame A, comprising in the present instance uprights 2, connected by a top cross-bar 3 and a bottom cross-bar 4.

6 denotes brackets at the upper ends of the uprights, and 6 brackets at the lower ends of the uprights, said brackets 6 being provided with slots 7, through which the draft-bars 8 and the rack-bars 9 pass freely. The draft-bars are connected to draft-springs 10, the upper ends of said springs being connected to brackets 5, and the upper ends of the rack-bars are provided with or connected to racks 11, which engage pinions 12 upon a drum 13, which in the present instance is shown as carried by a shaft 13, which is journaled in the uprights. The lower ends of the draft-rods are pivoted to an evener 15, at the center of which is rigidly secured a hook 16, to which the weighing-pan (not shown) may be attached.

17 denotes an eye carried centrally by the evener, through which a spring cross-rod 18 passes loosely. In the present instance I have shown the eye and the hook as made integral. It is not material, however, so far as the spirit of my invention is concerned whether the hook and eye are made in one piece or not. The ends of the spring cross-rod pass through sleeves 19 at the lower ends of the rack-bars and are provided at their extreme ends with slots 20, which receive the edges of the draft-bars.

21 denotes collars on the spring cross-rod, which are held in position thereon by set-screws and serve to retain the parts in operative position. It will be noted (see Fig. 5) that the spring cross-rod is loose enough in the eye to permit free movement of the rod. The object of this construction is to permit uneven stretching of the springs without in any way affecting the accuracy of the scales.

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In setting up the scales all the springs are the same length, but in use they frequently stretch unevenly. In my present construction it is a matter of no consequence whether the evener is parallel with the spring cross-rod or not. When the weight is applied, if one spring stretches more than the other and if the evener is tilted to a plane out of parallel with the spring cross-rod the pull upon the spring cross-rod exerted by the contents of the weighing-pan will still be central. Consequently there will be no side movement or cramping of any of the parts, and the accuracy of the scale will be in no way affected by the uneven stretching of the springs.

In order to limit the upward movement of the draft and rack bars and stop the backward rotation of the drum when merchandise that has been weighed is removed from the weighing-pan, I provide stop-pins 22 on the draft bars, which are adapted to engage some fixed portion of the scale (in the present instance brackets 6) to limit the upward movement of the draft-bars, and consequently of the evener, spring cross-rod, and rack-bars, and thereby stop the backward rotation of drum. Owing to the fact, however, that cross-rod 18 is resilient and acts as a spring when the upward movement of the draft-rods is stopped by the engagement of the stop-pins with brackets 6, the upward movement of the rack-bars is not checked instantly and the backward rotation of the drum is stopped yieldingly, thus preventing any appreciable shock or strain upon the frame of the drum.

The drum is preferably of the character described and claimed in my said reissued Letters Patent referred to; but without regard to the construction of the drum itself there is this important difference in the columns of figures thereon. Instead of one column of figures to indicate pounds and ounces, I provide the surface of the drum with two columns of figures to indicate pounds and ounces, said columns reading in opposite directions, as clearly shown in Fig. 4, one of said columns being indicated by *a* and the other by *b*. These columns may be side by side or separate, as preferred, and may be at the center or either end of the drum, as preferred.

The object in providing two columns of pound and ounce figures running in opposite directions is to enable a purchaser to read the weight of the article in the weighing-pan from the back of the scale. This I accomplish by providing an opening 23 in the back of the casing, (see Fig. 2,) through which one column of figures may be read, (in this instance column *a*,) and by providing an opening 24 in the front of the casing and out of line with opening 23, through which the other column of figures (in the present instance column *b*) may be read. Another important difference is that instead of repeating the figures denoting pounds and adding ounces at each repetition I use relatively large figures, not repeated, to represent pounds and relatively small figures, as "4, 8, 12," to indicate the number of ounces in addition to the number of pounds.

c denotes columns of figures parallel with columns *a* and *b* and arranged in alinement therewith which indicate the amount of money to be charged for the merchandise that is being weighed.

25 denotes the usual opening across the front of the casing through which the figures indicating the amount of money to be paid for the merchandise that has been weighed are visible, opening 25 preferably intersecting with opening 24, as shown in Fig. 1. Below opening 25 I provide upon the casing a line of figures designated by *d*, which indicates (in the present instance from "3" to "30") the number of cents per pound to be charged for the merchandise that is being weighed, the operation being as follows: If "6" is the number of pounds indicated at openings 23 and 24 and the price per pound to be charged for the merchandise is eight cents, the user will find "72" indicated in opening 25 just above the figure "8" belonging to the line of figures which I have indicated by *d*.

e is a line of figures above opening 25, which indicates in dollars and cents the amount to be charged for a predetermined number of pounds of merchandise, for example, twenty pounds, as shown in the drawings, at any special price per pound, in the present instance from five to thirty cents per pound. As the number of pounds indicated on the drum in the present instance is "20" and as it is frequently desirable to weigh merchandise running up to more than twenty pounds in weight, it is obvious that after the numerals indicating from "1" to "20" pounds upon the drum have passed the zero-mark "1," "2," "3" pounds, and so on, will be again indicated at opening 24.

To ascertain the amount to be charged for any number of pounds within the capacity of the scale and above twenty, the user adds to the amount indicated in opening 25 the corresponding amount indicated in line *e* immediately above the amount in column *a* on the drum which appears at opening 25 immediately above the numeral in line *d*, which indicates the price per pound. Openings 23, 24, and 25 in the casing are in practice covered with glass.

26 denotes characters to denote the zero-point, (in the present instance pointers or arrows,) which are placed upon the glass over openings 23 and 24 at the proper point to register with zero in columns *a* and *b*, respectively.

Having thus described my invention, I claim—

1. In a scale of the character described, the combination with a casing having openings 23 and 24 in opposite sides thereof, said openings being covered with transparent material having stationary pointers thereon, of a drum adapted to rotate in said casing, racks and

springs substantially as specified for rotating said drum, the said drum being provided with two independent columns of figures to indicate pounds and ounces, said columns of figures reading in opposite directions and being visible at openings 23 and 24 respectively, and each of said openings being adapted to permit the reading of the figures in one column only, the pointers on the transparent coverings being so arranged that when one weight is indicated by the pointer at opening 23, the said weight is also indicated by the pointer at opening 24, whereby the two indications correspond with each other.

2. In a scale of the character described, the combination with a casing having openings in opposite sides but not opposite each other, of a revoluble drum provided with a series of columns of figures representing dollars and cents and two independent columns of figures representing weights in pounds and ounces, one column of the latter being arranged to be read from the same side of the casing as the figures representing dollars and cents, and the other column of weight-figures being arranged to be read solely through the opening on the opposite side of the casing, the figures representing dollars and cents not being visible from said opposite side, the openings in the opposite sides of the casing being covered with transparent material having stationary pointers thereon adapted to correspond with each other in their indications of figures so that when the pointer on one side indicates one figure in one column, the other pointer on the other side will indicate exactly the same figure in the other column.

3. In a scale of the character described, the combination with the draft-bars and the rack-bars, of an evener pivoted to the draft-bars and carrying an eye 17 and a cross-rod 18 connected to the rack-bars and passing loosely through the eye, a casing having openings 23 and 24 in opposite sides thereof, a drum having pinions engaging said rack-bars and adapted to rotate in said casing and provided with two independent columns of figures to indicate pounds and ounces, said columns of figures reading in opposite directions and being visible at openings 23 and 24 respectively.

4. In a scale of the character described, the combination with the draft-bars and the rack-bars, of an evener pivoted to the draft-bars and carrying an eye 17 and a cross-rod 18 connected to the rack-bars and passing loosely through the eye, a casing having openings 23, 24, and 25, a drum having pinions engaging said rack-bars and adapted to rotate within the casing and provided with columns of figures to indicate amounts of money which are adapted to register with opening 25 and with two independent columns of figures to indicate pounds and ounces, said two columns of figures reading in opposite directions and one of said columns being visible at opening 23 and the other at opening 24.

5. In a scale of the character described, the combination with the draft-bars and the rack-bars, of an evener pivoted to the draft-bars and carrying an eye 17, and a cross-rod 18 connected to the rack-bars and passing loosely through the eye, a casing having openings 23 and 24 on opposite sides thereof, a drum having pinions engaging the said rack-bars and provided with two independent columns of figures to indicate pounds and ounces, pounds in said columns being indicated by relatively large figures and ounces by relatively small figures, said columns of figures reading in opposite directions and being visible at openings 23 and 24 respectively.

6. In a scale of the character described, the combination with the draft-bars and the rack-bars, of an evener pivoted to the draft-bars and carrying an eye 17 and a cross-rod 18 connected to the rack-bars and passing loosely through the eye, a casing having openings 23 and 24 and 25, and below opening 25 a line of figures indicating prices per pound for purchases, and above opening 25 a line of figures indicating amounts to be charged for a predetermined number of pounds of merchandise, a drum having pinions engaging said rack-bars and adapted to rotate within the casing and provided with columns of figures visible at opening 25 to indicate amounts to be charged for merchandise between one pound and the predetermined number of pounds, and with independent columns of figures visible at openings 23 and 24 respectively, to indicate pounds and ounces.

7. In a scale of the character described the combination with the draft-bars and the rack-bars, of an evener pivoted to the draft-bars and carrying an eye 17 and a cross-rod 18 connected to the rack-bars and passing loosely through the eye whereby cramping of the parts is prevented should the evener be tilted out of parallel with the cross-rod.

8. The combination with the draft-bars and the rack-bars having sleeves 19, of an evener pivoted to the draft-bars and carrying at its center an eye 17 and a cross-rod 18 which passes through the sleeves and bears upon the draft-bars and the center of which passes loosely through the eye upon the evener so that cramping of the parts will be prevented and the pull upon the rack-bars will be even at all times.

9. In a scale of the character described the combination with brackets 6 having slots 7 and the draft-bars and rack-bars which pass through said slots, of the evener and spring cross rod 18 by which the draft-bars and the rack-bars are respectively connected, means for connecting said evener and spring cross-rod and stop-pins 22 in the draft-bars which are adapted to engage the brackets to limit the upward movement of the draft-bars and rack-bars and stop the backward rotation of the drum.

10. In a scale of the character described the combination with a frame, the draft-bars hav-

1180

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ing stop pins 22 adapted to engage the frame and the rack-bars, of an evener pivoted to the draft-bars and a spring cross-rod connected to the evener and to the rack-bars, said spring cross-rod being adapted to yield when the stop-pins engage the frame and thereby prevent shock to the drum.

11. The combination with the frame, the drum, the rack-bars and the draft-bars having stop pins 22, of an evener pivoted to the draft-bars and carrying an eye and a spring cross-rod which passes through the eye and is connected to the rack-bars, whereby when the upward movement of the draft bars is stopped by the engagement of the stop pins with the frame the backward rotation of the drum is stopped yieldingly.

In testimony whereof I affix my signature in presence of two witnesses.

ALBERT U. SMITH

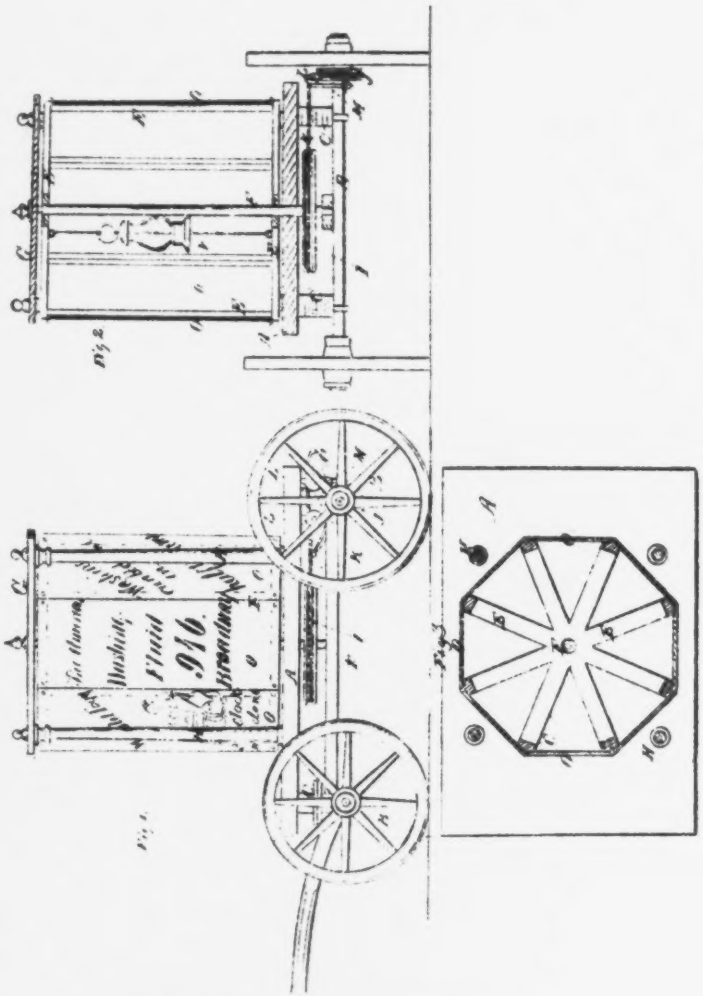
Witnesses:
ORLANDO J. ALLEN,
HARRY B. SMITH.

1181

G. W. Thompson,
Advertiser.

679

No. 78552. Patented June 2 1868



Witnesses

Inventor

1182

681

UNITED STATES PATENT OFFICE.

GEORGE W. THOMPSON, OF NEW YORK, N. Y.

IMPROVEMENT IN WAGONS FOR ADVERTISING.

Specification forming part of Letters Patent No. **78,332**, dated June 2, 1868; antedated May 25, 1868.

To all whom it may concern:

Be it known that I, GEORGE W. THOMPSON, of the city, county, and State of New York, have made certain new and useful Improvements in Advertising-Wagons; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 represents a side elevation of my improved wagon. Fig. 2 is a vertical cross-section of the same. Fig. 3 is a horizontal section of the revolving drum of the same.

Similar letters of reference indicate corresponding parts in the several figures.

The nature of my invention consists in having a vertically arranged revolving reel upon the platform of a wagon, upon the periphery of which transparent signs for advertising are placed, so that when a light is placed within and the wagon is set in motion at night the signs are illuminated and are revolved by the motion of the wagon, whereby more astonishment is produced and more notice taken of the specific advertisement by the public, and the spectator is more fully caused to read and see the advertisement in particular than with advertising wagons or mediums heretofore known or used.

To enable others skilled in the art to make and use my invention, I will proceed to describe the construction and operation.

A represents the body or platform of the wagon. The wheels B, axles C, and springs D, upon which the body rests, are all made in any ordinary way.

E represents a polygonal reel, with an axle, F, arranged vertically upon the platform.

G is a fixed top over the reel, and rests upon posts H H, and serves as a bearing for the upper end of the axle of the reel, the lower end being guided in the platform or body of the wagon. In certain cases it may be preferable to rest and guide it as well in the running-gear of the wagon, as shown in the drawings.

I is a large pulley, fixed upon the lower end of the axle F, and a small pulley, J, is fixed on the hub of one of the hind wheels of the wagon; and in order to guide and run a belt, K, transmitting the motion from the pulley J on the hub of the wheel to the reel, I provide two guide-pulleys, L L, pivoted to a support, M, bolted to the hind axle of the wagon, as shown in Figs. 1 and 2, in proper position to guide the belt K on the pulley J, nevertheless the up-and-down motion of the wheels. Now, on each of the open sides of the reel I place one of the advertisements or signs, which are painted on rectangular sheets of transparent paper or cloth, each of the size to cover one of the sides of the reel, and in order that these signs may be made more durable, so as to be re-covered or taken off the reel, I provide the edges of the signs with a wooden frame.

In order to illuminate the reel and the advertising-signs when used at night, I place and secure a lantern, N, inside the reel, as shown in Fig. 2.

From the foregoing it is clearly seen that the signs presented on a vertically-arranged reel or drum afford ready view to the spectator; nevertheless, being revolving and with little expense, the said drum and signs may be made of a large size and contain a great deal of advertising-matter, and the appearance of them, more especially at night, engages the spectator to great interest.

Having fully described my invention, what I claim therein, and desire to secure by Letters Patent, is—

1. The employment of the vertically-arranged revolving drum of advertisements or signs, substantially as and for the purposes herein shown.

2. The arrangement of the pulley J, with the guide-pulleys L L and the pulley I, for transmitting motion to the axle F, substantially as and for the purpose stated.

GEO. W. THOMPSON.

Witnesses:
R. BOEKLEN,
JAS. CHAPMAN.

1183

W. H. PHINNEY. 683

SCALE FOR SHOWING WEIGHT AND PRICE.

No. 106,869. Patented Aug. 30, 1870.

Fig 1

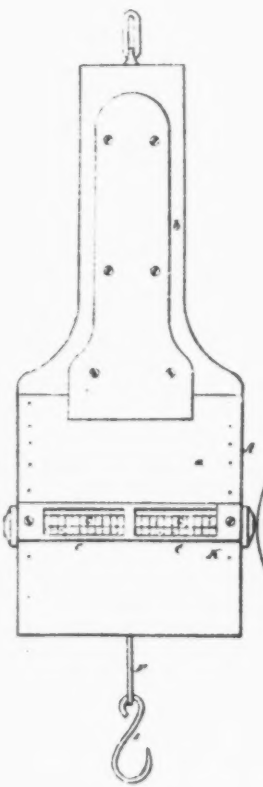


Fig 2

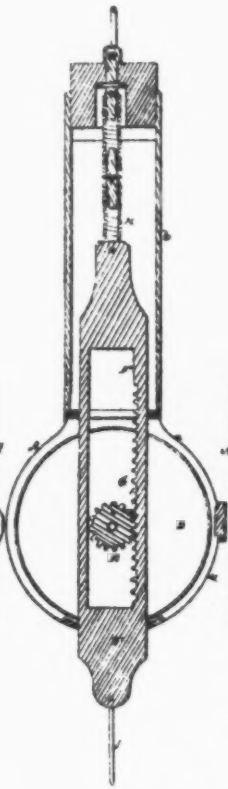


Fig 3.

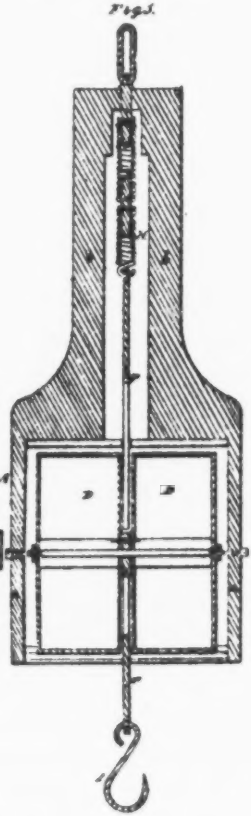
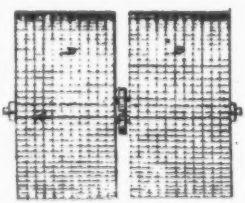


Fig 4.



Witnesses

S. N. Pyper

J. Rhoads

William H. Phinney

By his attorneys

H. Haddock

1184

United States Patent Office.

WILLIAM H. PHINNEY, OF PAWTUCKET, RHODE ISLAND

685

Letters Patent No. 106,869, *dated August* 30, 1870.

IMPROVEMENT IN SCALES FOR SHOWING WEIGHT AND PRICE.

The Schedule referred to in these Letters Patent and making part of the same.

To all persons to whom these presents may come:

Be it known that I, WILLIAM H. PHINNEY, of Pawtucket, of the county of Providence and State of Rhode Island, have invented a new and useful Apparatus for Determining the Weight and Value of Articles; and I do hereby declare the same to be fully described in the following specification, and represented in the accompanying drawing, of which—

Figure 1 is a front elevation;

Figure 2, a transverse section; and

Figure 3, a longitudinal section of such apparatus.

Figure 4 is a front elevation of the valuation cylinders separated from the case of the apparatus.

In such drawing—

A denotes the said case as composed of a drum, *a*, and a hollow or chambered arm, *b*, extending upward from and opening into such drum.

There are one or more slots, *c c*, made through the front of the drum, and formed trapezoidal, in transverse section, there being a scale, C, on the lower side of each slot.

This scale is divided into equal parts, each having a designating number upon it, as represented.

Within the drum there are arranged two cylinders, D D, whose lengths correspond very nearly, if not exactly, with those of the two slots.

They are disposed opposite the slots, and have a gear or toothed pinion, E, disposed between them, and fixed to them or their common axis or shaft.

A slotted bar, F, applied to the case, so as to be capable of moving vertically therein and out of the bottom of the drum, has a rack or series, G, of teeth, to engage with the said pinion.

The bar F depends from a helical spring, H, arranged within the case and suspended from its upper part, in manner as represented.

A hook, I, applied to the lower part of the slotted and toothed bar F, serves to enable an article to be weighed and valued to be connected with the bar.

The two cylinders are divided lengthwise on their peripheries by a series of lines, extending around them, and being at equal distances apart, they being in number corresponding to the divisions of the weight scale.

The said cylinders are also otherwise divided, viz., by a series of straight lines crossing the circles or divisions before mentioned, and arranged parallel to one another, and at or about at equal distances apart.

We will suppose that the parallel straight lines mark the arcs of revolution of the cylinders, caused by different weights being upon the hook I, that is, we will suppose that every additional quarter of a pound applied to the hook shall cause the cylinders or barrels to revolve one of their arcs of divisions, therefore we should number the said arcs 0, ¼, ½, ¾, and so on.

Opposite each of such numbers we mark the transverse divisions of the drum or drums with figures corresponding to the products resulting from multiplying the starting number by numbers of the scale C, indicative of the divisions.

Their numbers for the space marked ¼ would be ¼, ½, ¾, 1, 1¼, 1½, 1¾, 2, and so on, the whole being as represented in the drawing.

Now, suppose we desire to ascertain the weight and value of an article, we have only to hang it on the hook, which, being accomplished, the draft on the bar F will cause the bar to descend until stopped by the spring, the barrel or cylinders, in the meantime, being revolved, so as to indicate the weight at the right terminal circle of divisions.

Suppose the weight indicated to be two pound ad one-half, we look on the scale C for the price per pound, and whatever it may be opposite to it on the cylinder we shall find the value, or that twice multiplied by the weight.

If, for instance, we suppose the price to be ten cents per pound, and the weight as above, viz., two and one-half pounds, we should find on the drum, directly opposite the mark 10 of the scale C, the number 25, indicative of the value of the weight.

Thus, it will be seen that, at a glance at the price on the scale C, and at the number that on the drum may be next to the said price, we shall have the value of any article suspended from the hook.

The apparatus will be found very convenient for tradesmen, especially for butchers and venders of vegetables and fruits, who, by means of it, will be saved the necessity of first ascertaining the weight of an article, and next going through the process of multiplying such weight by the price per pound or ounce, as the drum number which may be next opposite the price number will indicate the value.

A small index-pointer, K, arranged on the middle of one end of the slot of the drum serves to show when any circular division of the weight scale may have reached its proper position.

The apparatus may be applied to a common steelyard beam or weighing-machine, so as to denote, by its operation, the value of any article weighed thereby, in which case the slide rack would be suspended from or appended to the beam, so as to be moved thereby.

I claim—

The arrangement and combination of the spring H, or its equivalent, the slide rack-bar F, the gear E, the scale C, and the divided cylinder or cylinders D, the whole being substantially as described.

W. H. PHINNEY.

Witnesses:

R. H. EDDY,

J. R. SNOW.

1185

E. M. MAY. 687

Signs.

No. 136,744. Patented March 11, 1873.

Fig 1.

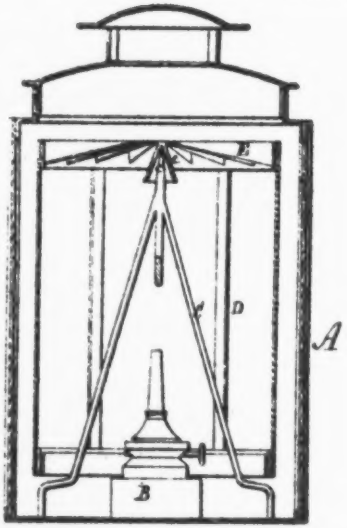
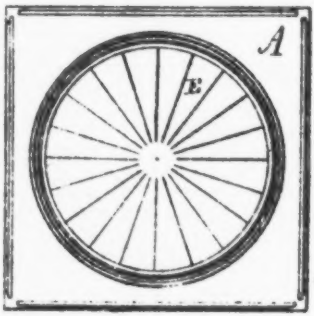


Fig. 2.



WITNESSES.

E. M. Bates.

Chas. F. Stiles

INVENTOR.

E. M. May.

Chapman & Sommers

Attys

1186

689

UNITED STATES PATENT OFFICE.

EDGAR M. MAY, OF FOND DU LAC, WISCONSIN.

IMPROVEMENT IN SIGNS.

Specification forming part of Letters Patent No. **136,744**, dated March 11, 1873.

To all whom it may concern:

Be it known that I, EDGAR M. MAY, of Fond du Lac, in the county of Fond du Lac and State of Wisconsin, have invented a new and valuable Improvement in Show-Lanterns; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a representation of a sectional view of my lantern. Fig. 2 is a top view of the same with chimney-cover removed.

My invention relates to an improvement in show-lanterns, for advertising or other purposes; and it consists in a revolving hollow cylinder suspended inside of a lantern, above the lamp, the upper end of the cylinder being closed by a current-wheel, which is acted upon by the current arising from the flame, and the cylinder thus caused to revolve horizontally about its axis.

In the drawing, A represents a lantern of any suitable construction, having its sides composed of glass, which may be either clear or ground, or slightly colored on the inner side. B is the lamp, outside of which is a wire frame-work, C, which terminates in a point, *c*, near the top of the lantern. D is the revolving hollow cylinder, consisting of a light frame-work of metal covered with paper or other suitable transparent or semi-transparent material, on which is represented any suitable design or advertisement or other figure which it may be desired to exhibit. The upper end of the cylinder is closed by a current-wheel, E, from the center of which projects downward a hollow cone, *e*, which is placed over the point *c*, so that the cylinder revolves about its vertical axis when the current from the flame of the lamp impinges against the sails or leaves of the wheel E.

What I claim as new, and desire to secure by Letters Patent, is—

In a show-lantern a hollow revolving cylinder suspended inside the lantern, and caused to revolve by the current from the lamp, substantially as shown and described.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

EDGAR MASON MAY.

Witnesses:

AUGUST CARSTENS,

T. S. HENRY.

1187

F. N. CHASE.
Indicator.

691

No. 212,789. Patented Mar. 4, 1879.

Fig. 1.

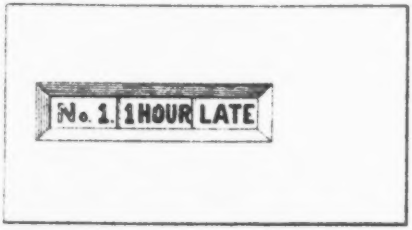


Fig. 2.

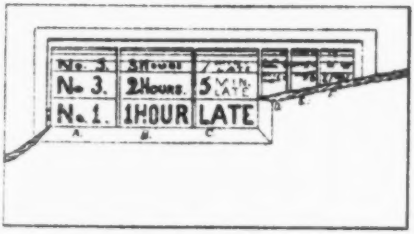


Fig 3.

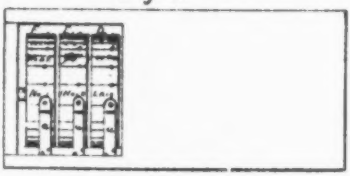
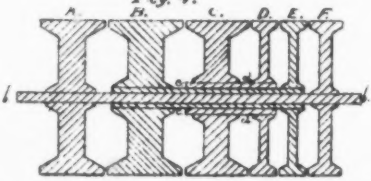


Fig. 4.



Witnesses,
James Rorke
T. J. Lucey

Inventor,
Franklin N. Chase

1188

693

UNITED STATES PATENT OFFICE.

FRANKLIN N. CHASE, OF BINGHAMTON, NEW YORK.

IMPROVEMENT IN INDICATORS.

Specification forming part of Letters Patent No. **212,789**, dated March 4, 1879; application filed November 16, 1877.

To all whom it may concern:

Be it known that I, FRANKLIN N. CHASE, of Binghamton, in the county of Broome and State of New York, have invented a new and useful Improvement in Railroad and Post-Office Indicators, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

The object of my invention is to enable a ticket-seller, telegraph-operator, or other railroad employé to correctly bulletin the situation of trains (whether on time or late, and, if late, how many hours or minutes) without leaving his office, or to enable a postmaster, in the same way, to bulletin expected mails, by the combination of cylinders, shafts, springs, and printed words and figures, as shown fully in the accompanying drawings.

Figure 1 is a perspective view of the indicator. Fig. 2 is a front view of a part of the cylinder, a portion of the front of the case being cut away. Fig. 3 is a view of the duplicate cylinders, showing the springs by which they are held at any desired point. Fig. 4 is sectional view of the cylinders and shafts.

A B C, Fig. 2, are three cylinders, six and three-quarter inches in diameter, and two and a half inches across the face, and made of either tin, wood, or iron, covered with white paper or Bristol board. On segments of the outer surface of A are printed the numbers of the trains, as "No. 1," "No. 2," &c., and also, if desired, the name by which a train is known, as "No. 5, Chicago Express;" also, for post-offices, the names of any mails desired, as "Albany mail."

On similar segments of B are printed, respectively, "1 hour," "2 hours," &c., up to ten hours; also on one segment the words "On time," and on another the word "Abandoned;" and for post-offices, on one segment the word "Distributed."

On similar segments of C are printed, respectively, "5 minutes late," "10 minutes late," &c., up to fifty-five minutes; and also on one segment the word "Late."

Cylinders A B C are attached, respectively, to cylinders F E D by the small solid shaft *b b* and two hollow shafts, *c c* and *d d*, Fig. 4, so that A revolves with F, B revolves with E, and C revolves with D.

The cylinders F E D have a portion of their faces exposed and accessible to the employé in his office, but are not seen by the public. On segments of their surfaces are printed the same words and figures, respectively, as are printed on A B C, so that when F E D are set so that parallel segments will read, say, "No. 1, 1 hour late," as seen by the employé in his office, the segments of A B C, as seen by the public, will also read "No. 1, 1 hour late," and so on of any combination desired.

Each of the cylinders F E D are set at any point desired by means of the springs *a a a*, Fig. 3, having slots fitting on small spurs on the cylinders.

The working parts of this indicator are inclosed in a wooden case about seven inches deep, seven inches high, and fourteen inches long, intended to be set in the wall, between the railroad employé's or postmaster's office and the public room, a door in the back of the case giving access to the cylinders F E D. In the front cover of the case is an opening one and a half inch wide and seven and a half inches long, sufficient to expose to view three parallel segments of cylinders A B C, as shown in Fig. 1.

I claim as my invention—

In a railroad or post-office indicator, the combination of cylinders A B C, with the duplicate cylinders D E F, having similarly-printed surfaces, by means of the solid shaft and two hollow shafts, so that they revolve in pairs, any combination of words and figures on cylinders D E F being reproduced on cylinders A B C, in the manner and for the purpose as specifically set forth.

FRANKLIN N. CHASE.

Witnesses:

CHAS. M. BROWN,

L. B. SMITH.

1189

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2 Sheets—Sheet 1.

C. JENSEN.

Weighing Apparatus.

No. 221,826. Patented Nov. 18, 1879.

Fig. 1.

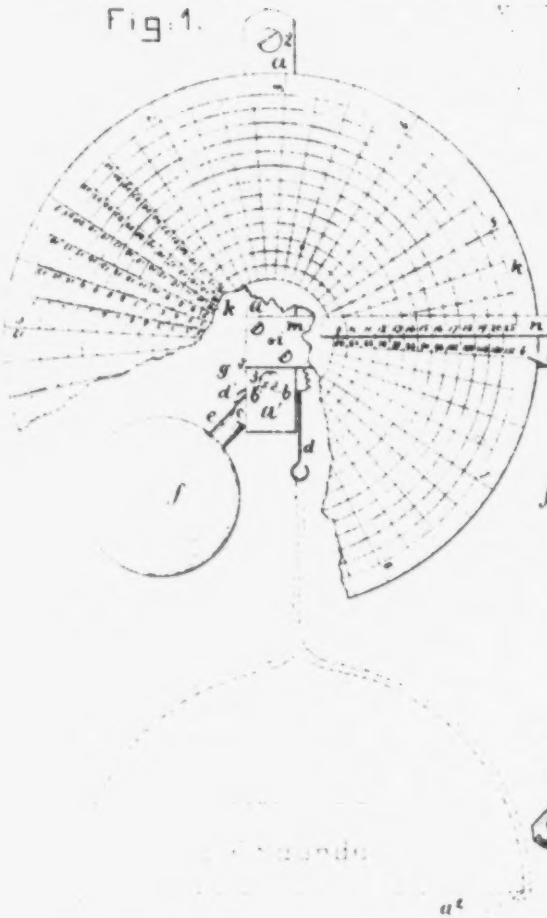


Fig. 2

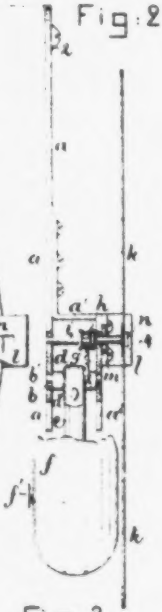
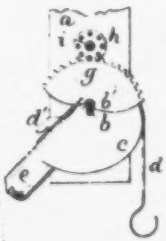


Fig. 3.



Witnesses.

Jos. P. Stevenson

L. J. Connor

Inventor.

Conrad Jensen.

by Crosby Gregory Atty.

1190

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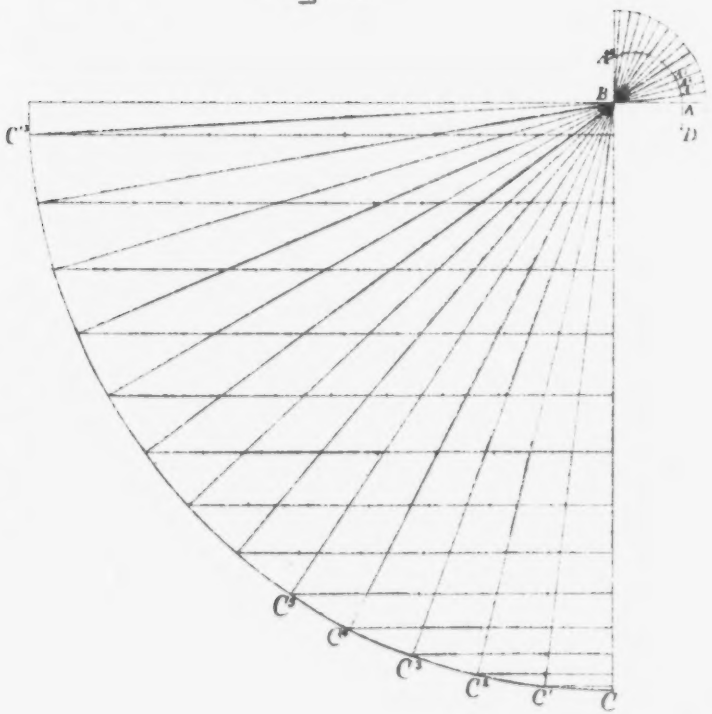
2 Sheets—Sheet 2.

C. JENSEN.

Weighing Apparatus.

No. 221,826. Patented Nov. 18, 1879.

Fig. 4.



Witnesses

Jos P Lieseman

L F Connor

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Conrad Jensen.

by Crosby & Gregory Atty.

1191

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UNITED STATES PATENT OFFICE.

CONRAD JENSEN, OF DEDHAM, MASSACHUSETTS.

IMPROVEMENT IN WEIGHING APPARATUS.

Specification forming part of Letters Patent No. **221,526**, dated November 18, 1879; application filed September 6, 1879.

To all whom it may concern:

Be it known that I, CONRAD JENSEN, of Dedham, county of Norfolk, State of Massachusetts, have invented an Improvement in Weighing Apparatus, of which the following description, in connection with the accompanying drawings, is a specification.

My invention relates to apparatus for weighing, and is embodied in a balance provided with a pan supported by means of a flexible cord or strap adapted to be wrapped or wound about a counterpoised spiral or cam-shaped drum, the article to be weighed, when placed in said pan, turning the drum and lifting the counterpoise more or less in the arc of a circle, the counterpoise rising more or less toward a horizontal position, according to the weight in the scale-pan. Attached to the same arbor with the spiral or cam-shaped drum is a segmental gear engaging a pinion upon a spindle, to which is attached a figured disk graduated at its edges to represent weights, as pounds and fractions thereof, or other desired weights.

A fixed pointer attached to the frame-work of the weighing apparatus indicates upon the graduated disk the weight of the article being weighed as the disk and spiral or cam-shaped drum are turned by the said article in the scale-pan or other usual support upon which articles to be weighed are placed.

An arm fixed with relation to the disk and frame-work is extended from the pointer at the periphery of the disk inward toward the center thereof, and upon it are marked figures to represent the prices per pound or other unit of weight of the articles commonly weighed, and the disk is marked out with figures arranged radially from near the center of the disk to the different weight-indicating divisions of the periphery, said figures on the disk forming a series of concentric circles in line with the figures on the rigid arm, each of said disk numbers representing the total value of the weight indicated at the end of the radial line at the price indicated by the figure opposite it on the fixed arm, which we may call the "price arm." The device thus indicates at a glance the weight and value of the article.

A peculiar form of periphery is required for the spiral or cam-shaped drum, in order that the disk may turn through equal arcs for equal addition of weight, as will be hereinafter fully described.

Figure 1 is a front view of my improved weighing apparatus, part of the disk being broken away to show the parts behind it; Fig. 2, a side view thereof; Fig. 3, a detail showing the cam-shaped drum and connected mechanism; and Fig. 4, a diagram showing the method of laying out the curve for the periphery of the cam-shaped drum.

The frame *a a'* is provided near the upper part with screw-holes 2, or other suitable means to enable it to be attached firmly to some larger frame-work, or to a portion of the building or counter where it is to be used, and its lower portion has suitable bearings for the arbors of the cam-shaped drum and disk.

The arbor *b* of the cam-shaped drum *c* is shown as a small spindle re-enforced or strengthened by the stouter rod *b'*, this form giving great strength with very small friction, and causing it to keep always in one place, which a knife-edge on a plane surface, as commonly used, would not do.

The metal of the frame *a a'* is cut away, as at 3, above the bearing *b b'*, to permit the arbor to turn for the proper distance.

The scale-pan a^2, or other suitable means—as, for instance, a hook for holding or supporting the article to be weighed—is suspended upon a flexible cord or strap, *d*, herein shown as a thin metallic ribbon, connected at one end, as at d^2, with and adapted to be wrapped more or less around the cam-shaped drum *c*, in such a manner that it always rests in contact with the upper portion of the drum, and passes therefrom in a vertical line tangent thereto.

Attached to the drum *c*, or forming a part thereof, is a rigid arm or beam, *e*, adapted to sustain the counterpoise *f*, which in its normal condition, with the scale-pan empty, hangs nearly vertically down; but when the suspending-ribbon is pulled by a weight in the scale-pan, the said drum is turned, the arm is vibrated, and the counterpoise is elevated, the arm *e* moving in a direction to approach more or less a horizontal position, it, by reason of its increasing leverage as it rises from its vertical position, requiring more or less weight on

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the pan or strap to move it. Consequently the higher the arm and weight are elevated the greater the weight of the article.

The counterpoise *f* may be secured to the arm *e* by a set-screw, *f'*, the arm passing through a hole in the counterpoise, thus admitting of ready adjustment when required.

Attached to the arbor *b*, and turning therewith, is a segmental gear, *g*, which engages the pinion *h* on the arbor *i*, which carries the disk *k*, said disk being preferably attached to the arbor by a thumb-screw, as shown in dotted lines at *k*, Fig. 3, so that other disks with different figures may be readily substituted, if desired.

The disk *k* is graduated at its periphery to represent the desired units of weight and their fractions, here shown as pounds and eighths, and a fixed pointer, *l*, attached to the framework, indicates by the graduations opposite to it upon the disk the amount of the weight in the scale-pan by which the disk is rotated through the suspending ribbon *d* and intermediate connections.

The pointer *l* is herein shown as formed upon an arm, *m*, attached to the frame *a'* near the center of the disk, and passing behind the disk to its edge, where it is bent around the said edge, and a portion, *n*, is extended back in front of the disk to near its center, as in Fig. 1. This arm *n*, which I call the "price-arm," is divided into suitable divisions, which are marked with figures to represent the price per unit of weight or per pound of the articles most commonly sold; and upon the disk *k* is a series of concentric circles corresponding to the divisions of the price-arm, on which, in radial lines, are placed numbers, some of which are shown in Fig. 1, running from the center of the disk to the divisions at its edge, said numbers representing, respectively, the price of the article weighed, its weight being indicated by the figure at the end of the disk, at the rate or price—say, per pound—represented by the figures opposite to them upon the price-arm.

To illustrate the operation of the apparatus, it will be supposed that the scale-pan (shown in Fig. 1) sustains a weight of six pounds, which is indicated by the figure 6 upon the edge of the disk *k* opposite the pointer *l*. If, for example, the price of the article is fourteen cents per pound, we look opposite the figure 14 on the price-arm and find the number 84, which is the price of six pounds at fourteen cents per pound. This forms a very ready means of telling the cost of an article, and with this apparatus there is very little possibility of making mistakes.

Referring to Fig. 4, I will explain the method of laying out the curve for the drum *e*.

It will be seen that the connection between the scale-pan and its load and the counterpoise forms a bent lever, which may be represented by the line A B C. A representing the point of application of the weight of the article to be weighed, or the tangent point of the suspending ribbon *d*, Figs. 1 and 3; B representing the fulcrum or spindle *b*, Figs. 1 and 3; and C the center of gravity of the counterpoise.

The points C^1 C^2, &c., represent the positions taken by the counterpoise as successive weights are added in the scale-pan, and the horizontal lines ending in those points represent the effective length of the lever-arm of the counterpoise in the successive positions indicated by the said points. It will be seen that these lever arms do not have a uniform increment for equal arcs passed over by the counterpoise, but vary as the sines of the total angles passed over.

It is desirable that the graduations on the disk should be uniform, and consequently that the counterpoise should pass over equal arcs for equal increments of weight in the scale-pan, and consequently the effective length of the short arm of the lever A B C (represented by the lines B A, B A', &c.) must vary in proportion to those of the counterpoise, (represented by the horizontal lines C' C^2, &c.)

For convenience, the counterpoise and empty scale-pan may be assumed to weigh one pound each, and that they then will hang in the position A B C', and the line A' B, which will be drawn by the weight of the empty scale-pan to the horizontal position coinciding with A B, may be taken equal to the horizontal line C'. If, now, we add one pound in the scale-pan, the counterpoise will move to C^2, and the line B A^2 will become horizontal, and we shall have two pounds at A^2 to balance one pound at C^2, or, by the well-known mechanical law, the line B A^2 must equal one-half the horizontal line C^2. From like reasoning it will be seen that the lines B A^2, B A^3, B A^4, &c., must be respectively one-half, one-third, one-fourth, and so on, the horizontal lines C^1 C^2 C^3, &c., and thus the outline A A^n for the drum is obtained.

As herein shown, the ratio of teeth in the gear *g* and pinion *h* is such that the disk *k* makes a complete revolution for an oscillation of the counterpoise through a little less than a quadrant. By changing the position of the counterpoise on its arm and substituting a new dial a different range of weight may be given, if desired.

It is obvious that the pointer might revolve and the dial be stationary without departing from my invention; also that two or more price-arms might be used on different sides of the center of the disk; and the gears may be so arranged that the disk may turn less than a whole revolution in the full oscillation of the counterpoise.

I am aware that a fixed and a revolving disk have been used in weighing apparatus to calculate the total value of articles weighed.

It is obvious that two or more drums may be used of different size, to thereby give different ranges of weight, according to the size of the drum to which the scale pan is attached.

I claim—

1. The described weighing apparatus, con-

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sisting of a rotating graduated disk and its fixed price-arm and pointer, in combination with the cam-shaped drum, its counterpoise, and suspended pan, the drum arbor composed of a small bearing-spindle and an upper reenforcing rod, a segmental gear, an engaged pinion, and the disk-shaft, all substantially as shown.

2. The cam-shaped drum, its reenforced arbor *b b'*, and cut-away bearings 3 therefor, in combination with weight supporting and indicating mechanism, substantially as shown and described.

3. In a weighing apparatus, a pivot formed, as described, of a double pin, having a lower portion of small diameter reenforced by an upper portion of larger diameter, as and for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CONRAD JENSEN.

Witnesses:
CHAS. E. HUBBARD.
JOS. P. HAVERMORE.

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(No Model.) 703 5 Sheets—Sheet 1.

H. POTTIN.

RECORDING AND REGISTERING APPARATUS FOR TILLS.

No. 312,014. Patented Feb. 10, 1885.

Fig. 7.

Fig. 1.

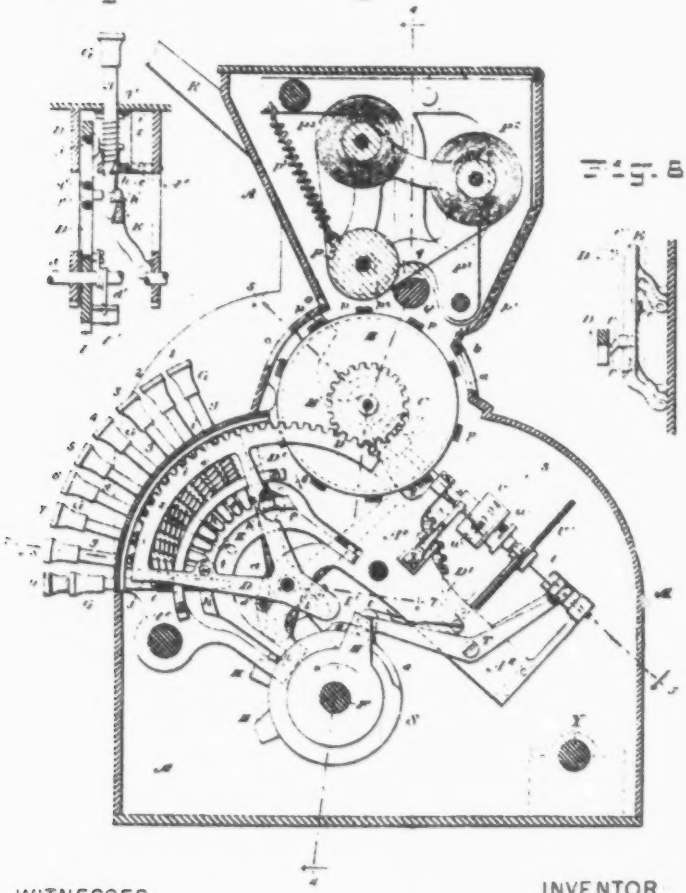

Fig. 8.

WITNESSES.

INVENTOR.

Henry Pottin.

By his Attorneys

Bundy, Dean & Emmons

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(No Model.) 705 5 Sheets—Sheet 2

H. POTTIN.

RECORDING AND REGISTERING APPARATUS FOR TILLS.

No. 312,014. Patented Feb. 10, 1885.

Fig. 2.

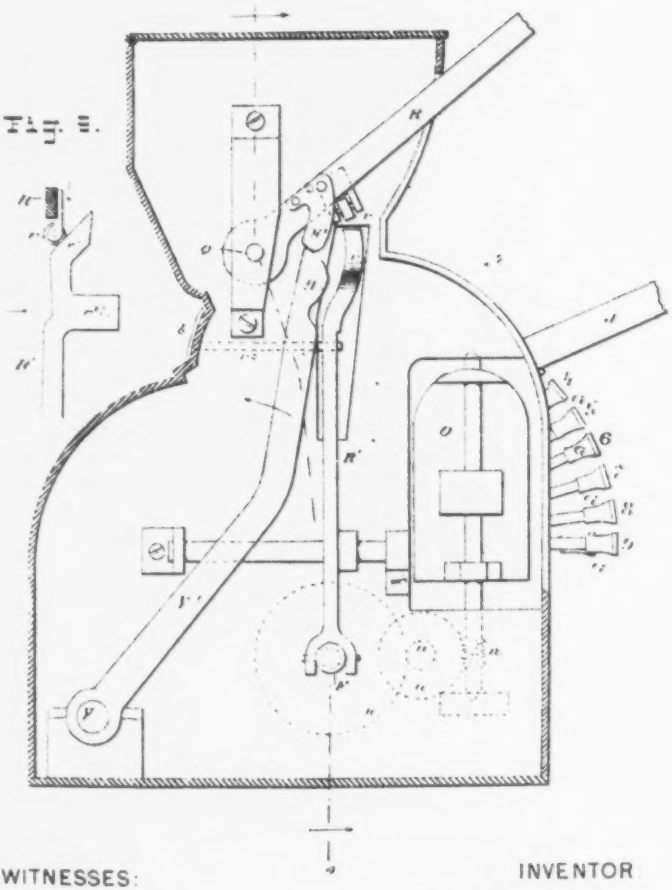

Fig. 3.

WITNESSES:

L. B. Bills.

Geo. H. Fraser

INVENTOR

Henry Pottin.

By his Attorneys,

Bundy Fraser & Connolly

1196

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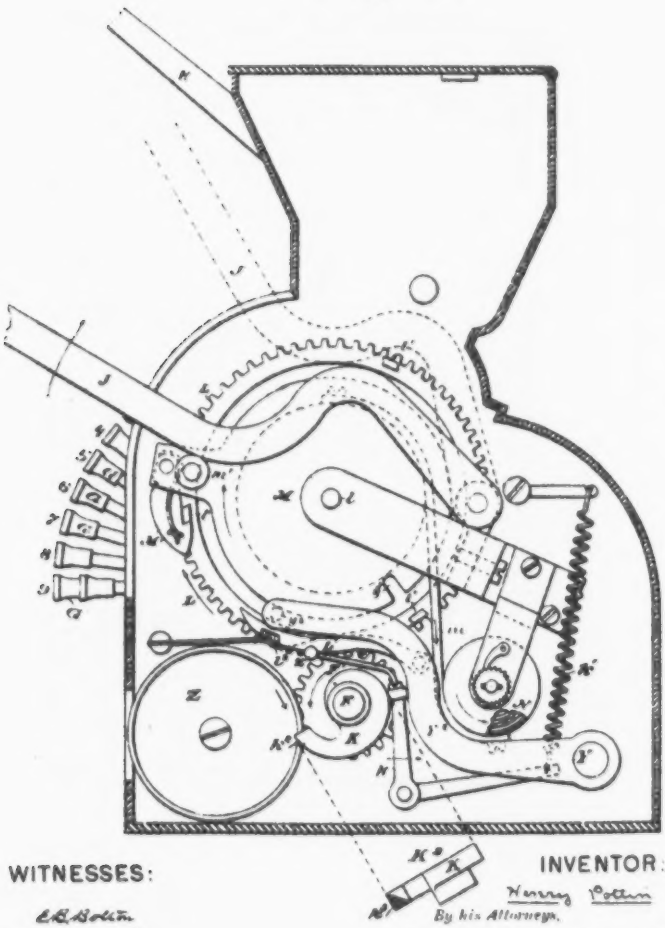
(No Model.) 5 Sheets—Sheet 3

H. POTTIN.

RECORDING AND REGISTERING APPARATUS FOR TILLS.

No. 312,014. Patented Feb. 10, 1885.

Fig. 3.



WITNESSES:

E. B. Bolton

Geo. H. Graves.

INVENTOR:

Henry Pottin

By his Attorneys.

Burby Graves & Donnelly

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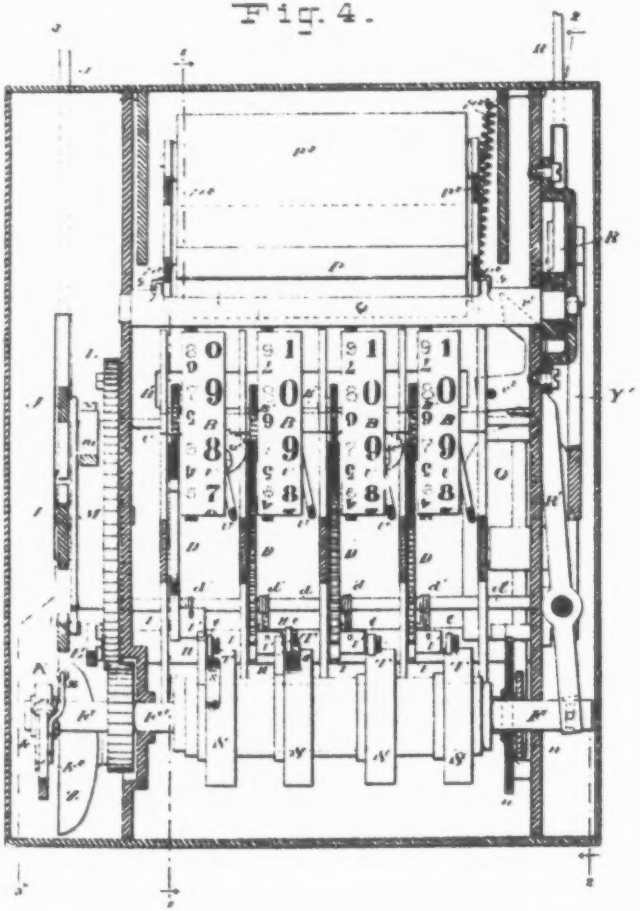
(No Model.) 5 Sheets—Sheet 4

H. POTTIN.

RECORDING AND REGISTERING APPARATUS FOR TILLS.

No. 312,014. Patented Feb. 10, 1885.

Fig. 4.



WITNESSES:

Wm. Bolton

Geo. H. Graves

INVENTOR:

Henry Pottin

By his Attorneys

Burby Grave & Sommers

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(No Model.)

711

5 Sheets—Sheet 5.

H. POTTIN.

RECORDING AND REGISTERING APPARATUS FOR TILLS.

No. 312,014. Patented Feb. 10, 1885.

Fig. 5

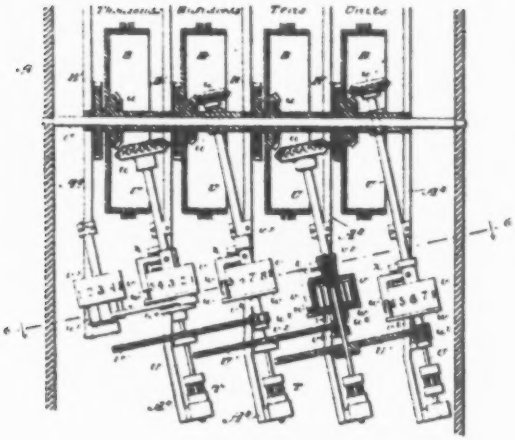
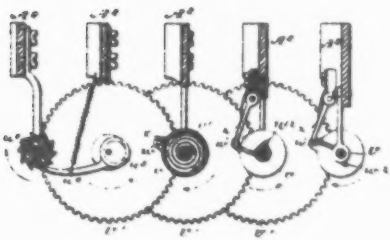


Fig. 8.



WITNESSES:

H. C. Dodge

Geo. H. Graves.

INVENTOR

Henry Pottin.

By his Attorneys

Burby Brown & Connolly

UNITED STATES PATENT OFFICE.

HENRY POTTIN, OF PARIS, FRANCE.

RECORDING AND REGISTERING APPARATUS FOR TILLS.

SPECIFICATION forming part of Letters Patent No. 312,014, dated February 10, 1885.

Application filed February 13, 1884. (No model.) Patented in England July 4, 1882, No. 3,311.

To all whom it may concern:

Be it known that I, HENRY POTTIN, a citizen of the French Republic, and a resident of Paris, France, have invented certain Improvements in Counting and Registering Apparatus for Cashiers, of which the following is a specification.

My invention relates to a machine for counting, registering, and adding sums of money received or paid, and is designed for the use of cashiers, bank-tellers, and others who receive and disburse moneys. To satisfy all the requirements of an apparatus of this character it should perform the functions following:

First. When the cashier has received a sum of money from a customer, it is necessary that the figures representing the sum paid shall be made to appear first to the cashier in order that he may know that they are correct.

Second. If the sum indicated is incorrect, he should be able to correct it before the Customer sees the figures, and before the sum is "totalized," or carried to the total for the day.

Third. When the cashier ascertains that the figures are correct, he should then be able to show them to the customer.

Fourth. The cashier should be able to print the sum on a slip, ticket, or invoice for the customer, and at the same time on a strip of paper within the machine, which forms a register or day-book, upon which all the separate sums are entered.

Fifth. The several sums received during the day should be added together by the operation of the machine, in order that the proprietor may ascertain by inspection the sum total at the end of each day or any other period.

Sixth. The mechanism should be such that after each transaction the indicating-drums bearing the numerals may all be brought to zero—that is, so that only noughts or blanks will show.

My apparatus effects all of these several operations.

The accompanying drawings show the preferred form of my apparatus.

Figure 1 is a vertical section cut in the plane of the line 1 1 in Fig. 4. Fig. 2 is a side elevation of the left-hand side of the machine, a portion of the inclosing-case being in section on line 2 2 in Fig. 4. Fig. 3 is a similar elevation of the right-hand side of the machine, the inclosing case being partly in section on line 3 3 in Fig. 4. Fig. 4 is a vertical section cut in the plane of the lines 4 4 in Figs. 1 and 2, and looking in the direction of the arrows 4. Fig. 5 is an oblique elevation, showing only the totalizing mechanism, looking in the direction of arrow 5 in Fig. 1, and partly in section on the plane of line 5 5 therein. Fig. 6 is a section of the totalizing mechanism cut in a plane perpendicular to the plane of Fig. 5, as indicated by the line 6 6 in Fig. 5; and Figs. 7 and 8 are fragmentary sectional detail views, their sections being cut respectively in the planes of the lines 7 7 and 8 8 in Fig. 1. Fig. 9 is a fragmentary detail view looking in the direction of arrow 9 in Fig. 2.

Let A designate, generally, the inclosing-case of the apparatus, constructed to conceal the working parts and prevent unauthorized access to them. In this case are mounted a series of wheels or drums, B B, having each two series of digits, from 0 to 9, marked on their peripheries. The digits of the first series are in large and prominent figures, and those of the second in smaller figures, inverted relatively to the first, and arranged at one side, as clearly shown in Fig. 4. In the front of the case are a series of openings, which come close to these wheels, through each of which may be seen one of the series of large figures on each wheel. One of these openings (lettered *a*) is shown in Fig. 1, and also in section is shown a slide, *b*, which covers the row of openings, and has openings registering with them, whereby on being slid to one side it closes the openings *a a*, and to the other side it opens them. The small inverted figures of the second series are not visible through these openings, but coincide with a series of openings on the opposite side of the apparatus, one of which (lettered *c*) is seen in Fig. 1. There will be as many wheels B B as there are figures in the highest number designed to be registered by the apparatus. This will be determined by the requirements of the particular currency used in the transactions to be recorded. Thus for the United States there should be one wheel for cents, one for dimes, one for dollars, one for tens of dollars, one for hundreds, and so forth, as high as it

may be desired to go. The drawings show only four of these wheels, as these are sufficient to illustrate all the requisites of the apparatus. The wheels B B are mounted loosely on a fixed shaft or rod, C, extending through the apparatus, as shown in Fig. 3, and each wheel has fixed to it a gear, B'. Meshing with the several gears B' B' are as many toothed racks or segments D D, one of which is clearly shown in Fig. 1. Each rack D has an extreme limit of motion equal to nine spaces, or sufficient to turn the wheel B nine-tenths of a revolution, or from 0 to 9. The wheel B, (shown in Fig. 1,) which is the one shown at the left in Fig. 4, has been turned to this extent. In so turning it its rack D has dropped or moved a distance of nine spaces. A rack, D, (also lettered D',) is shown in Fig. 1 in its normal position, being drawn partly in full lines and partly in dotted lines. The several racks D D are shown as made in the form of segments, and mounted to oscillate freely on a shaft, *d*, being each provided with a small spring, *d'*, to start it on its backward or downward movement. Thus each rack D has imparted to it by this spring or by its own weight, or both, a continual tendency to move backward and downward and to impart a forward rotary movement to the wheel B, geared to it. At one side of each rack D is arranged a pivoted frame or lever, E, which is pressed toward the rack by a spring, *e*, (shown in dotted lines in Figs. 1 and 7,) and constitutes a detent. On the frame E is a beveled projection or tooth, *f*, which engages a similar projection, *f'*, on the rack, as shown best in Fig. 8. Normally, the rack is held from falling by the engagement of these teeth *f f'*; but if the frame E be pressed to the right in Figs. 7 and 8 the tooth *f* will free itself from the tooth *f'* and release the rack D, as shown in dotted lines in Fig. 8, whereupon the rack will commence its descent.

Projecting from the rear of the apparatus, on the side on which the cashier or operator is stationed, are several series of keys or push-buttons, G G. Each series consists of nine buttons arranged one below another, and numbered from 1 to 9 from the top downward, as indicated by the numbers opposite them in Fig. 1. There will be as many series or vertical rows of these buttons as there are wheels B B. One button alone is shown in Fig. 7. Each button is, as there shown, mounted on a pin or stem, *g*, which passes through a hole, *g'*, in the casing and through another hole, *g''*, in a frame, A', inside. These holes form bearings to guide the stem *g* as the button is pushed in, and between the two bearings a helical spring, *s*, is coiled around the stem and arranged to press outward against a small pin, *i*, fixed transversely in the stem, thus pressing the button outward. The inner end of the stem *g* is beveled, and comes just in front of the beveled edge of the frame E, and just back of this beveled end the stem *g* is notched to form a hook, A. The frame E is made with an undercut groove, which forms its curved end into a continuous hook, A', as best seen in cross-section in Fig. 7. When any button G is pressed in, its beveled end wipes over the edge of the frame E, thereby pressing the frame to one side and freeing the teeth *f f'*, as described, and the hook A on the stem *g* engages with the hook A' on the frame E, and holds the button pressed in. The rack D, being released by the freeing of its tooth *f'*, begins its movement, and continues to move until a projection, *j*, Fig. 7, on its edge encounters the pin *i* of the button G, which has been pressed in, whereupon it is stopped by that pin. The nine buttons G G of each series and their stems *g g* are equally spaced in succession, and each successive button is arranged to stop the rack D at the completion of an additional one ninth of its movement, the pressing in of the upper button, 1, stopping the rack when it has made one-ninth of its movement, the pressing in of the second button, 2, stopping it when it has made two-ninths, and so forth, the lower button, 9, stopping it when it has moved nine-ninths or its utmost movement. The wheels B B stand normally with 0, appearing both at opening *a* and at opening *c*. If the button 1 be pressed in, the rack D will move one-ninth of its movement, and will turn the wheel B, with which it is geared, one-tenth of a revolution, thereby displaying 1 at the openings *a* and *c*. If the button 9 be pressed, the rack will move nine-ninths of its movement and turn the wheel nine-tenths of a revolution, thereby displaying 9 at the openings *a* and *c*.

I will now describe the restoring mechanism, or means for turning the racks D and wheels B back to zero. On a shaft, F, passing through the machine, are fastened a series of radial arms, H H, having disk-like hubs. There are as many arms as there are racks D D. On each rack D is formed a tail or crank, I, and projecting from each tail I is formed a tooth or pin, I'. As the shaft F rotates in the direction of the arrow in Fig. 1 the arm H encounters the projection I' and pushes it to the rear, thereby moving the rack D up to its normal position and turning the wheel B backward to zero. When the normal position is reached, the arm H escapes beneath the projection I' and is free. As the rack D reaches its normal position its tooth *f'* encounters the tooth *f*, and by wiping over its beveled face pushes the frame E to one side far enough to free the hook A of the button G, whereupon the button springs outward again, and as tooth *f'* passes the tooth *f* the frame E springs back to place and engages the teeth *f f'* again. The several arms H H are arranged radially one in advance of another, as seen in Fig. 1, in order to act successively on the racks D D. They are so proportioned that if all the racks D had been dropped to 9, only one would be replaced at a time, the next coming to rest before the second commenced to move, and so on through the entire series. The

"units" (cents) rack will be first restored, the "tens" (dimes) the second, the "hundreds" (dollars) the third, &c.

The restoring operations are performed by one rotation of the shaft F in the direction of the arrow in Fig. 4. This rotation is accomplished through clock-work by mechanism shown best in Fig. 3.

On the end of shaft F are fixed a pinion, F', and a snail-cam, K. The pinion meshes with a large gear-wheel, L, having three times as many teeth. This wheel L is mounted on a short arbor, *l*, and close beside it on this arbor is a wheel, M, to which is fastened one end of a strap, (or chain,) *m*, the other end of which wraps around a barrel, N, inclosing a clock-spring, which tends to rotate it in the direction of the arrow marked on it. The wheel M bears a pawl or catch, M', the hooked end of which is adapted to engage either of three teeth, *l' l' l'*, on the wheel L. A hand-lever, J, is pivoted within the case, and projects out through a slot, where it can be grasped by the operator. Normally this lever stands in the position shown in dotted lines, and the wheel L is locked fast by one of its teeth *l'* being confined in a notch, *l''*, in a pawl, L', which is pivoted to the fixed frame or casing. When the operator pulls down on the lever J, it encounters a roller, *m'*, borne by the wheel M, and presses it down, thus rotating the wheel backward and winding on it the strap *m*, which it unwinds from the barrel N. The wheel M executes one-third of a revolution, until its pawl M' presses up the pawl L'. The lever J is then released and the tension of the spring in N causes the wheel M to revolve forward to its normal position, carrying the wheel L with it, and thus rotating the wheel F and shaft F one revolution, at the end of which the pawl L' again engages a tooth *l'*. The parts are shown in Fig. 3 at about the middle of this upward movement. The speed of rotation of the shaft F is governed by a fan or flier, O, (shown in Figs. 2 and 4,) which is driven from the shaft through a train of gears, *o s*. (Shown in dotted lines in Fig. 2.)

I will now describe how the several amounts are printed or recorded on a strip of paper. Each wheel B bears three sets of figures, as clearly shown in Fig. 4, two of which I have already described. The third set consists of types formed of groups of needle-points *p p*, the figures being thus composed of dots. These are arranged between the small figures of the second series, as shown. When the large figure 0 or 1 appears through the opening *a* and the small figure 0 or 1 appears at *c*, the corresponding needle figure stands at the top of the wheel B, in close proximity to a roller, P, mounted in a frame, P', pivoted at *p'*, Fig. 1. A strip of paper unwinds from a roller, P², passes beneath the roller P, and winds on a roll, P³. On the frame P' close to each bearing of the roller P is a tooth, *p²*. (Shown in dotted lines in Fig. 1.) An oscillating shaft, Q, passes through the frame, and has a tooth, *q*, which when the shaft is oscillated presses down the tooth *p'*, rocks the frame P', and brings the roller P down against the needle-types *p*, thus pricking the number through the strip of paper. By inserting a check slip or invoice through a slot, *e*, the needles will prick through both, and the slip on being withdrawn will bear the perforated figures denoting the amount recorded. As the shaft Q oscillates back it releases the frame P', which is drawn up by a spring, *p³*, and in ascending the strip of paper is fed by any suitable devices, which, being well known, are not illustrated. The shaft Q is oscillated by pulling down a hand-lever, R, at the left-hand side of the machine. (Shown best in Fig. 2.) This lever bears a roller, *r*, which acts on the inclined surface *r'* of a lever, R', as best seen in Fig. 9, and so tilts this lever. This lever bears a pin, *r²*, which moves the register-slide *b* on this movement of the lever, and so uncovers the openings *a a*. The lower end of this lever is coupled to the end of shaft F, and so moves this shaft endwise. On this shaft F are fixed a series of circular cams, S S—one to each wheel B—which cams serve to operate the "totalizing mechanism" or integrator through rollers *t t* on the ends of levers T T. The right-hand side (in Fig. 4) of each cam S is a plain cylinder, while its left-hand side has cam projections or depressions *s s*. Normally the shaft F stands at the left, (in Fig. 4,) so that the rollers *t t* roll on the cylindrical portions of the cams, and the "totalizer" is not operated; but on pulling this shaft to the right, as in Fig. 4, the projections and depressions come under the rollers *t t* and the totalizer is brought into action.

Enough of the mechanism has now been described to enable the operation of the apparatus to be understood.

When the cashier receives a sum of money, he proceeds to record it. Suppose the amount to be $20.47. He will first press in the button 2 of the thousands series, (tens of dollars,) which is at his right hand. He will skip the hundreds (units of dollars) series, because the wheel B of this series already stands at zero. He will then press button 4 of the tens (dimes) series, and finally button 7 of the units (cents) series. The number will appear to him in reverse, thus: "74.02," through the series of openings, *c*. If on reading it here he should discover that he had made any mistake, he would pull down the right hand lever J, and thereby restore the indicating wheels to zero without either printing or totalizing the incorrect amount. This result is due to the action of the arms H H, which turn back the racks, the cams S S being impotent to actuate the totalizer, because their plain cylindrical portions are under the rollers *t t*. But if the cashier, on reading the number at *c*, finds it correct, he pulls the left-hand lever R, which moves the slide *b* to uncover the openings *a a*, thereby exposing the amount "20.47" in large figures, to the view of the customer,

and at the same time printing or perforating it on the strip of paper, and also, if desired, on a ticket or invoice which the cashier will have inserted in the slit *o*. The amount having been correctly indicated, the cashier then pulls the lever J, at the right, which causes the shaft F to make one revolution and simultaneously restores the indicating mechanism to zero, and actuates the totalizer, which adds the amount recorded to the total of the amounts previously recorded. When the shaft F completes its revolution, a bell, Z, rings, thus indicating that the operation is finished, and a new amount may be recorded, and simultaneously the slide *b* moves back and closes the apertures *a c*.

It will be observed that when the lever J is pulled first the totalizer is not actuated, but when the lever J is pulled after the lever R has first been pulled the totalizer is actuated. This result is due to the longitudinal displacement of the shaft F by the lever R' and to the formation of the cams S S, as already described. The shaft F is moved endwise back to its first position at the conclusion of its revolution by the action of the snail K. A lever, *k*, has a roller on its end, which rides on this snail, and is pressed toward the snail by a spring, *k'*. As the shaft F revolves the snail presses back the lever *k* until the latter stands opposite the end *k'* of the snail, which is beveled, as shown best in the edge view at K', under Fig. 3. The roller, impelled by the spring *k'*, rolls down this incline, and so moves the snail and the shaft F endwise back to place, at the same time also replacing the lever R' and the slide *b*. The lever *k* bears on its end an elastic hammer-arm carrying a hammer, *c*, which as the lever descends from the end of the snail strikes a blow upon the gong Z.

I will now describe the totalizing mechanism, referring to Figs. 1, 5, and 6. Inside each wheel B is fixed a bevel-gear, *n*, having ten teeth, and a gear, *n'*, having also ten teeth, is fixed on the upper end of a diagonal arbor, U. The successive gears *n' n'* are arranged alternately above and below the gears *n n*. The foot of each arbor U is engaged by the end of one of the levers T. Normally the several gears *n' n'* are moved away from the gears *n n* far enough to be out of mesh therewith, and it is only when the arbors U U are raised or lowered by the levers T T that the gears *n'* are brought into mesh. This raising or lowering of the arbors is determined by the projections or depressions *s s* on the cams S S acting on the rollers *t t*. Each arbor U (except the first or units arbor) has a gear, U', fixed on it, and each one (except the last or, in the construction shown, thousands arbor) bears a pinion, *n'*. The gears U' have each ten times as many teeth as the pinions *n'*, so that one rotation of either pinion will turn the gear with which it is in mesh one-tenth of a revolution. Each arbor U bears a cup-shaped wheel or drum, *c*, (shown in section in Fig. 5,) which is splined to it, so as to turn with it, and its periphery is marked with digits from 1 to 9 and 0. In each cup *c* is a coiled spring, *s'*, as shown on the tens arbor in Fig. 5, where the cup is in section. One end of this spring is attached to the cup, and the other end to a disk, *w*, which is fixed on the hub or sleeve of the pinion *n'*, which is loose on the arbor. Each disk *w* has a pin, *w'*, which is engaged by a detent or small lever, *x*, Fig. 6, which is pivoted to a frame, A", and is pressed toward the arbor by a light spring, and has a leg which rests against the hub of the cup *c*, on which is formed a tooth, *w'*. As the arbor U and cup *c* revolve the spring *s'* tends to make the disk *w* and pinion *n'* revolve also, but they are restrained by the pin *w'* resting against the detent *x* until the arbor has completed one revolution, when the tooth *w'* lifts the detent, and the latter frees the pin *w'*, and the spring *s'* causes the disk *w* and pinion *n'* to instantly turn one revolution, when the pin *w'* again encounters the detent *x*, which meanwhile has dropped back to place on the passage of the tooth *w'*. Next to each pinion *n'* is an annular space or groove, *t'*, these spaces being arranged alternately above and below the successive pinions.

The totalizing operation is as follows: Just before the restoring mechanism commences to turn back the first or units drum B the units-cam S tilts the lever T, and thus lowers the units arbor U until its gear *n* meshes with the gear *n*. As both gears *n n'* have ten teeth, and as the drums B move always only in tenths of a revolution, these gears are certain to mesh correctly. The drum B is then rotated backward to zero by the restoring mechanism, and in so doing it turns the units-arbor U an equal fraction of a revolution. The arbor turns the indicating cup *c* with it, and if the movement is sufficient to turn this past 9 to 0, or farther, then in passing 9 the pin *w'* is released and the pinion *n'* turns instantly one revolution and turns the wheel U' of the tens arbor one tenth of a revolution, thus rotating that arbor and its cup *c* that distance. When the units wheel B reaches zero, the units-arbor U is again elevated, and then the tens arbor U is elevated until its gear *n'* meshes with the gear *n* of the tens-wheel B. The wheel U' lifts with the arbor and stands with its teeth entering the groove *v'* above the units-pinion *n'*, so that it can turn freely. The tens-wheel then is turned back to zero, thus rotating arbor U, and when the movement is finished this arbor drops and its wheel U' again falls into correct mesh with the units-pinion *n'*. The pinions *n'* are kept from lifting or dropping with their arbors, and so losing mesh with the wheels U' which they actuate, by bearings *v' v'*, between which the cup *c* and the pinion *n'* are confined. The hundreds arbor U is then dropped into engagement with the wheel B, so that its gear U' stands in the groove *v'* beneath the tens-pinion *n'*. This is the position shown in Fig. 5. After the hundreds-arbor is lifted again the thousands-ar-

bon is lifted, turned, and dropped, thus completing the operation. The thousands-arbor has no pinion a', but instead bears an eccentric a'. Fig. 6 is such works a pawl, a', which pawl works a ratchet-wheel, a', which turns a drum, a', which is externally like the ones r. This records the tens of thousands.

In addition to the mechanism already described, I also provide means for preventing either lever J or R being pulled while the other is down and before it is replaced. On one end of a shaft, Y, is fixed a lever, Y', and on its other end is fixed a lever, Y². The lever Y has a cam, y, on its end, which is acted on by a piece, y', on the lever R, as seen in Fig. 2. When lever R is pulled, it first, through piece y' pushes back lever Y', as denoted by the arrow before it can act on lever R' or on the printing mechanism. The lever Y² is shown in Fig. 4. It bears a pin, y², which when the apparatus is at rest stands opposite a notch, j', in the rim of the wheel M. When lever R is pulled, it presses back levers Y and Y', and the pin y² moves freely into the notch j'. But if the lever J has first been pulled down, as shown, standing against the edge of the wheel M and cannot move, hence the lever Y opposes the movement of the lever R. If, on the other hand, the lever R has been pulled and is not yet replaced, it holds the lever Y back, and the pin y² is in the notch j', and hence the lever J cannot turn the wheel M.

It is obvious that instead of using needle-types p p, for printing the numbers into the paper, ordinary raised types may be employed in connection with an inking ribbon, as in a type-writer.

It is obvious that instead of having indicating wheels n n separate from and operated by the carried racks D D, the racks might themselves be provided with broad peripheral surfaces on which the figures might be marked, and on which the printing or printing types might be impressed. This would necessitate no essential change in the apparatus, but involve a re-arrangement and reproportioning of the parts, as any intelligent mechanician could easily perform.

I claim as my invention

1. In a cash counting apparatus, the combination, with an inclosing case, of indicating systems, each consisting of a movable indicating part, having a normal tendency to move in one direction, a detent normally restraining said part from moving, and a series of keys arranged in succession, each adapted when depressed to displace said detent and thereby release the indicating part, and to intercept or stop said part, and each key provided with a hook or shoulder adapted to be engaged by the detent, whereby the key is held depressed, substantially as set forth.

2. In a cash counting apparatus, the combination, with an inclosing case having a series of openings, a a, on one side and another series of openings, c c, on the other side, of a series of indicating-wheels each having marked on it two series of digits relatively inverted and arranged to correspond with the positions of the respective openings, whereby when one digit of one series is visible through an opening, a, the same digit of the other series is visible through an opening, c, substantially as set forth.

3. In a cash counting apparatus, the combination, with an inclosing case having a series of openings, a a, on one side and another series of openings, c c, on the other side, of a series of indicating-wheels each having marked on it two series of digits relatively inverted and arranged to correspond with the positions of the respective openings, whereby when one digit of one series is visible through an opening, a, the same digit of the other series is visible through an opening, c, substantially as set forth.

4. The combination, to form a cash recording apparatus, of an inclosing case having a series of openings, a slide closing said openings and having apertures registering therewith, a series of indicating systems, substantially as described, the several indicating wheels whereof are marked with digits arranged to appear at said openings and are provided with types, a printing mechanism, substantially as described, for impressing said types upon a strip of paper, and a lever arranged in connection with said slide and printing mechanism, substantially as described, whereby on depressing said lever the indicated amount is simultaneously exposed to view by said slide and printed by said printing mechanism, substantially as set forth.

5. The combination, to form a cash recording apparatus, of wheels N N, bearing types p p, of a printing mechanism consisting of printing-roller P, frame P', in which said roller is mounted, projections p' p' on said frame, shaft Q having projections q q, and lever R, substantially as set forth.

6. In a cash counting apparatus, the combination, to form an indicating system, of a rack, D, tending to move in one direction, a detent-lever, E, having tooth f, engaging said rack, and formed also with a hook or shoulder, h, a spring, e, for said detent, a series of keys, G G, each consisting of a button, a, a cam, g, hook h, and spring s, and each adapted when depressed to displace the detent, thereby releasing the rack and to become hooked to the detent, and thereby retained in place to stop the rack, substantially as set forth.

7. In a cash counting apparatus, the combination of an indicating system consisting of a rack, D, a detent, E, adapted to restrain said rack, and a series of keys, G G, adapted to release said detent and to intercept the rack at different points in its travel, with a restoring mechanism consisting of a rotary shaft, an arm or projection thereon adapted to engage

device, of a movable indicating part marked with digits and having a normal tendency to move in one direction, a detent restraining said part from moving, and a series of keys arranged in succession, each adapted when depressed to displace said detent and thereby release said indicating part, and to intercept or stop said part, and each key provided with a hook or shoulder adapted to be engaged by the detent, whereby the key is held depressed, substantially as set forth.

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a projection on said rack and move it back to its starting point, and means for rotating said shaft, substantially as set forth.

8. The combination, in a cash-counting apparatus, of a series of indicating systems such as described, and a restoring mechanism, substantially as described, for turning back said systems to zero, arranged to engage the systems successively, and to restore each system before commencing to restore the succeeding one, as set forth.

9. In a cash-counting apparatus, the combination, with a series of indicating systems such as described, of a restoring mechanism consisting of the combination of a rotary shaft having arms or projections a clock-work device adapted when wound up to rotate said shaft one revolution, a pull-lever, and means, substantially as described, interposed between said lever and said clock-work, whereby the depressing of said lever winds up and releases the same, substantially as set forth.

10. In a cash-counting apparatus, the combination, to form a restoring mechanism, of shaft F, pinion F' thereon, gear L, meshing therewith, loose wheel M, having a pawl engaging gear L, a spring arranged to rotate said wheel M, pull-lever J, and stop-pawl L', substantially as set forth.

11. In a cash-counting apparatus, the combination, to form a restoring mechanism, of shaft F, pinion F' thereon, gear L, having teeth l' l', stop-pawl L', having notch l', wheel M, having pawl M', and pull-lever J, engaging wheel M, substantially as set forth.

12. The combination, to form a cash-counting apparatus, of an indicating mechanism consisting of a series of indicating systems such as described, the several systems indicating units, tens, hundreds, &c., with a totalizing mechanism, such as described, consisting of a series of corresponding systems for units, tens, hundreds, &c., and operative connection, substantially as described, between each of the indicating systems and the corresponding systems of the totalizing mechanism, whereby the movements of the several indicating systems are imparted to the respective totalizing systems and the numbers indicated by each of the former are added to the total sum indicated by the latter, substantially as set forth.

13. The combination, to form a cash-counting apparatus, of an indicating mechanism consisting of a series of indicating systems such as described, indicating, respectively, units, tens, hundreds, &c., a totalizing mechanism, such as described, consisting of a series of corresponding systems for units, tens, hundreds, &c., a restoring mechanism for the indicating systems, substantially as described, whereby they are turned back to zero successively one at a time, and connecting mechanism, substantially as described, between each indicating system and the corresponding totalizing system, whereby during the turning back of the former it is connected to and turns forward the latter, thereby adding the number which has been indicated to the total sum recorded by the totalizing mechanism, substantially as set forth.

14. The combination, to form a cash-counting apparatus, of a series of indicating systems such as described, a totalizing mechanism such as described, a restoring mechanism such as described, and means substantially as described, the operation of which brings the totalizing mechanism into operative connection with the restoring and indicating mechanisms, whereby the manipulation of such means before the restoring is essential to the operation of the totalizing mechanism.

15. In a cash-counting apparatus, the combination, with the several indicating-wheels B B of the series of indicating systems such as described, of a gear, *n*, fixed to each wheel and having ten teeth, a series of totalizing-arbors, U U, each having fixed to it a gear, *n'*, having ten teeth adapted to mesh with the gears *n n*, and means, substantially as described, for moving said arbors to bring their said gears into and out of mesh with the gears *n n*, substantially as set forth.

16. In a cash-counting apparatus, the combination, with the several indicating-wheels B B, of gears *n n*, fixed respectively thereto, totalizing-arbors U U, having gears *n' n'* fixed to them respectively, and adapted to mesh with the gears *n n*, levers T T, adapted to move said arbors endwise to bring their gears *n'* into mesh with gears *n*, cams S S, adapted to operate said levers, and rotary shaft F, carrying said cams, substantially as set forth.

17. In a cash-counting apparatus, the combination, with the several indicating systems, of a totalizing mechanism consisting of a series of totalizing-arbors, U U, bearing indicating-drums, pinions *n' n'*, borne by said arbors, spring and escapement device, substantially as described, for releasing each pinion upon its arbor having completed one revolution, and causing it to revolve, gears U' U', fixed to the respective arbors and normally meshing with said pinions, and means for successively rotating said arbors through the medium of the indicating system, substantially as set forth.

18. In a cash-counting apparatus, the combination, with the series of indicating systems substantially as described, the restoring mechanism substantially as described, and the totalizing mechanism substantially as described, of means, substantially as described, for longitudinally displacing the restoring shaft, and consequently bringing operative cam projections or depressions into action to manipulate the totalizing mechanism, as set forth.

19. In a cash-counting apparatus, the combination, with a series of indicating systems, a totalizing mechanism, and a restoring mechanism, the latter consisting in part of a rotating shaft, F, of a series of cams, S S, on said shaft, a series of levers, T T, operated by said

cams and manipulating the totalizing mechanism, means, substantially as described, for displacing said shaft endwise to bring said cams into operative connection with said levers, and means, substantially as described, for automatically shifting back said shaft at the end of its rotation, substantially as set forth.

20. In a cash counting apparatus, the combination, with restoring shaft F and the mechanism for rotating it, of a snail, K, fixed to it, spring-lever *k*, displaced by said snail, hammer *z*, borne by said lever, and bell Z, arranged to be struck by said hammer on the dropping of the lever by the end of the snail, substantially as set forth.

21. In a cash-recording apparatus, the combination of pull levers R and J, shaft Y, and levers Y' and Y², fixed thereon, and constructed, substantially as described, relatively to said levers R J, whereby on the displacement of levers Y' Y² by the pulling of either lever R or J they act as a stop to prevent the pulling of the other lever, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

HENRY POTTIN.

Witnesses:
EDWARD P. MACLEAN,
AMAND RITTER.

(No Model.)

J. W. PALMER.

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SCALE BEAM.

No. 328,804. Patented Oct. 20, 1885.

Fig. 1.

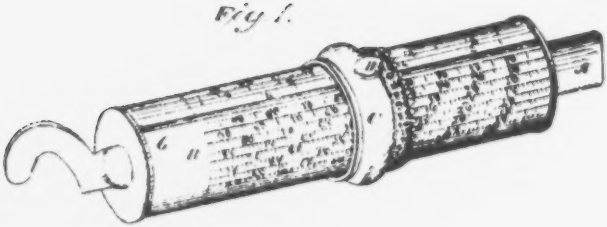


Fig. 2.

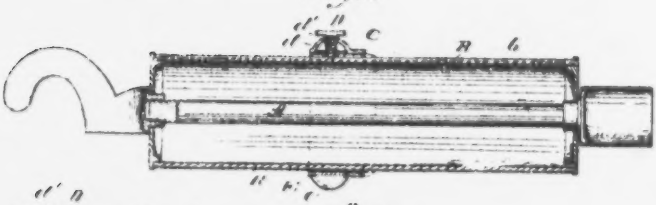
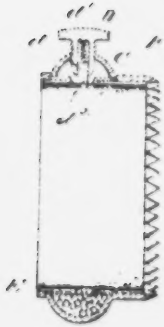
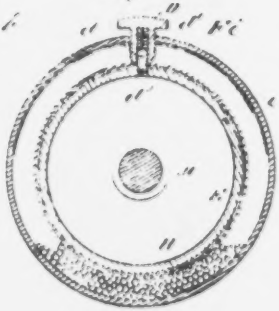


Fig. 3.





Witnesses:
E. J. Walker
E. E. Mason

Inventor:
John W. Palmer
by his Attorney
C. E. Foster

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UNITED STATES PATENT OFFICE.

JOHN W. PALMER, OF SYRACUSE, MISSOURI, ASSIGNOR OF ONE-HALF TO MARCUS E. TAYLOR.

SCALE-BEAM.

SPECIFICATION forming part of Letters Patent No. 328,804, dated October 20, 1885.

Application filed January 9, 1885. Serial No. 151,469. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. PALMER, a citizen of the United States, residing at Syracuse, in the county of Morgan and State of Missouri, have invented certain new and useful Improvements in Scale-Beams; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to that class of calculating scale-beams in which the beam carries a rotatable cylinder marked with graduated parallel longitudinal lines, and combined with a longitudinally-sliding weight having as many marked circumferential divisions or points as there are graduated longitudinal lines on the cylinder.

My improvement consists of certain features of construction and mode of mounting the sliding weight, which novel features are specifically pointed out in the claims at the close of this specification.

In order that my invention may be clearly understood, I have illustrated in the annexed drawings, and will proceed to describe, a practical form thereof.

Figure 1 is perspective view of my improved calculating scale-beam. Fig. 2 is a longitudinal sectional elevation thereof. Fig. 3 is a transverse section of the same. Fig. 4 is an axial section of the sliding weight. Figs. 3 and 4 are drawn on a larger scale than Figs. 1 and 2.

The same letters of reference indicate identical parts in all the figures.

The cylinder B is so mounted on the scale-beam A, preferably in the manner clearly shown in Fig. 2, that it may be freely rotated thereon, but cannot be moved longitudinally. The sliding weight C is a hollow band provided with a serrated circumferential flange, the several marked points of which point to the respective cross graduations of the longitudinal lines on cylinder A. The number of circumferential points on the sliding weight corresponds with the number of longitudinal lines on the cylinder. The points of the sliding weight may be numbered, and the longitudinal lines on the cylinder graduated and numbered, according to any known rule, to suit ordinary or special requirements. The sliding weight is connected with the cylinder, so that it cannot turn thereon, by a retaining-screw, D, which is screwed into a tapped hole in the outer wall of the weight, and projects with its foot through the inner wall thereof and into a longitudinal groove, *b*, of the cylinder.

The end of the retaining screw may constitute the interlocking foot; but I prefer to use as such foot a piston, *d*, placed in a cavity in the screw and projected by a spring, *d'*. This spring-actuated foot will cause the sliding weight to frictionally bind on the cylinder, so that the weight may not too easily slide. The friction between the cylinder and weight can be regulated by adjusting the retaining screw.

The foot or piston *d* of the screw may be shod with a rubber or leather shoe, *d''*.

The cavity of the sliding weight serves as a receptacle for shot, by which its measure or quantity may be nicely adjusted to the common standard. The screw-hole gives access to the cavity of the weight for loading it, and the retaining screw serves as a stopper in this connection.

In order that the sliding of the weight may have a polishing effect on the cylinder, I line the inner wall of the weight with leather or buckskin E, or with a similar soft polishing material.

Parts of my invention may be used without other parts thereof. For instance, the sliding weight may be solid instead of hollow; the leather lining of the sliding weight may also be omitted.

I claim as my invention—

1. The combination, substantially as before set forth, of the longitudinally-grooved cylinder of the scale-beam, the sliding weight, and the retaining screw.

2. The combination, substantially as before set forth, of the longitudinally-grooved cylinder of the scale-beam, the sliding weight, and the retaining-screw carrying a spring-actuated piston.

3. The combination, substantially as before

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set forth, with the cylindrical scale-beam, of the sliding weight lined with leather and fitting closely thereto.

4. The combination, substantially as before set forth, of the longitudinally-grooved cylinder of the scale-beam, the hollow sliding weight, and the retaining-screw.

In testimony whereof I affix signature in presence of two witnesses.

J. W. PALMER.

Witnesses:
E. T. WALKER.
E. L. WHITE.

(No Model.)

L. B. GIBSON. 725

WEIGHING AND PRICE SCALE.

No. 330,690. Patented Nov. 17, 1885.

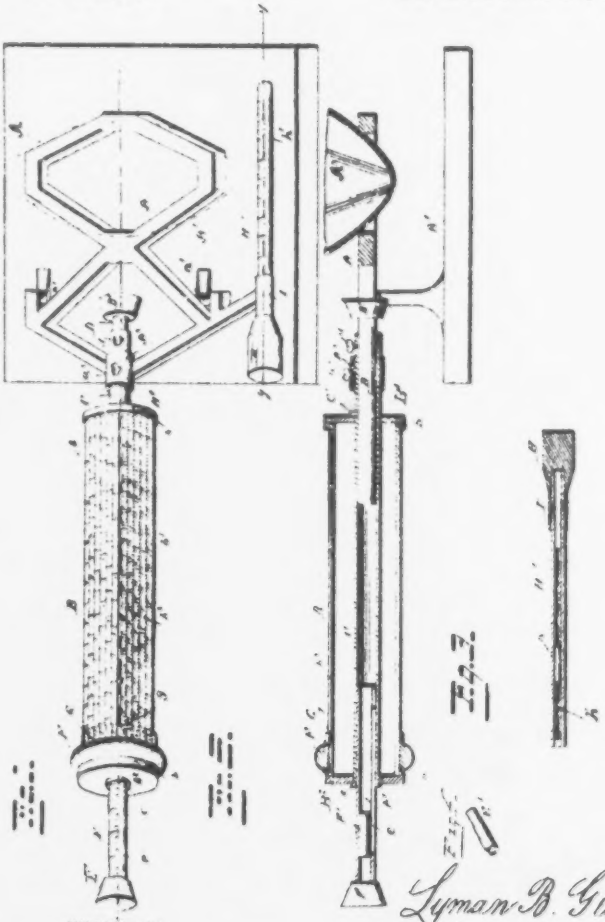

Fig. 7.

WITNESSES

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UNITED STATES PATENT OFFICE.

LYMAN B. GIBSON, OF ADDISON, ASSIGNOR OF ONE-HALF TO PLYNA EVANS, OF CAMPBELL, NEW YORK.

WEIGHING AND PRICE SCALE.

SPECIFICATION forming part of Letters Patent No. 330,690, dated November 17, 1885.

Application filed June 2, 1885. Serial No. 167,395. (No model.)

To all whom it may concern:

Be it known that I, LYMAN B. GIBSON, a citizen of the United States, and a resident of Addison, in the county of Steuben and State of New York, have invented certain new and useful Improvements in Scales; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to that class of counter-scales known as "combination-scales;" and it has for its objects, first, to dispense with the use of loose or separate weights; second, to construct a counter-scale provided with an improved index, by the use of which any proportion of a commodity with reference to its selling price may be accurately and conveniently weighed, and, third, in the use of an adjustable reversibly auxiliary weight adapted to be used for the purposes which will be hereinafter set forth.

To these ends my invention consists in the improved construction and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

Referring to the annexed drawings, Figure 1 is a perspective view of my improved combination counter-scale. Fig. 2 is a vertical sectional view taken on line *x x*, Fig. 1. Fig. 3 is a vertical sectional view taken on line *y y*, Fig. 1; and Fig. 4 is a perspective detail view of the spring-weight E', which will be hereinafter described.

The same letters of reference indicate corresponding parts in all the figures.

Referring to the several parts by letter, A represents the frame which supports the hopper and weighing devices in operative position upon the support or platform A'.

B represents a glass cylinder, which is lined with white pasteboard or other similar substance, which is marked in the manner which will be hereinafter described, or the cylinder may be made of any suitable opaque material and the gradations marked upon the exterior thereof. The glass cylinder is provided at each end with an end piece or cap, B' B', the said caps being provided with flanges *b*, to adapt them to fit upon the ends of the glass cylinder B, a metal pipe or core, C, passing through the glass cylinder and centrally through the end pieces thereof, being provided at its outer end with the bead or enlargement *c*, against which the outer cap, B', bears, while a pin, *c'*, inserted into the said core against the outer face of the rear cap, B', serves to hold the caps B' and B' firmly against the ends of the glass cylinder and cause them to revolve with the same. The inner end of the metallic core C passes through a sleeve or bearing, A', in the frame A, which is pivotally supported at *a'*, a thumb-screw, *a''*, serving to secure the said core in its adjusted position. In the inner end of the core C slides a rod, D, having on its inner end the weight D', the said rod being held in its adjusted position by the set-screw *d*. A tube, E, having on its outer end the weight E', slides in the outer portion of the core C, the said tube E being marked to denote pounds and ounces, and having placed within it the curved spring-weight E², which is held in position by its spring or tendency to expand after it has been adjusted in the tube E, for the purpose hereinafter set forth. The tube E is provided with a longitudinal slot, *e*, through which the spring-weight E² may be reached to adjust it back and forth in the tube as required.

An annular or ring shaped weight, F, which weighs one pound, slides upon the glass cylinder B, having secured to it the annular flat ring G, (which I will for convenience term the "price-list,") the said price-list being marked with figures running from 10 to 100, and the metallic price list being indented at a point between the figures 10 and 100 (which are contiguous) at *g* to adapt the portion thus depressed to fit and slide within a longitudinal groove, *b'*, on the outer face of the glass cylinder, thereby preventing the price-list and weight from turning on the said cylinder as it is moved from one end of the cylinder to the other. The white pasteboard lining of the glass cylinder B is provided with the longitudinal lines *b'*, the space between the said lines corresponding to the spaces on the price-list G in which the figures are placed, these spaces

between the lines being divided into as many portions as the numeral which stands at the end of the said space. For instance, the longitudinal space on the lining opposite to or registering with the numeral 10 is divided by transverse lines into 10 spaces, while the space opposite the numeral 85 is divided into 85 spaces, and so on.

An auxiliary weight H is secured on the outer end of the graduated tube H', which glides in a sleeve or bearing, I, on the side of the pivoted supporting frame A, as shown in the drawings, the said tube being provided with a longitudinal slot, h', and having placed within it a spring weight, h, similar in construction to the weight F' in the main tube E, the said auxiliary weight being used for the purposes hereinafter set forth.

To adjust the scale in its operative position, the glass cylinder B is first secured upon the core C, and the weight E' pushed in close against the outer cap, B', of the cylinder B, while the weight F is moved to the inner end, B', of the glass cylinder. By loosening the thumb screws a' and d the core carrying the cylinder may be moved in or out, and thus, in unison with the weight D', which is also moved in or out, caused to balance the scale and hopper A', when the thumb screws are tightened. A test pound weight is then placed in the hopper, and the weight F moved to the outer end of the cylinder B, and if the weight F is found to be too light in that position to balance the test pound weight, which is caused by the glass cylinder B being too short—say one-fourth of an inch—we then loosen the thumb screw a' and draw the core C out from the sleeve A' for one-fourth of an inch, thereby bringing the glass cylinder and weight F to a balance with the test weight. The test-weight is now removed, and the weight F moved back to the inner end of the glass cylinder when the weight D' is drawn out from the inner end of the core C to balance the adjusted cylinder.

The weight E', (which is used in connection with or in combination with the weight F when it is desired to weigh more than a pound of a commodity,) may be adjusted by first moving the annular weight F to the inner end of the glass cylinder B, placing a test pound-weight in the scoop or hopper A', and then drawing the graduated tube E out until it indicates one pound, when, if it is found that the weight E' does not balance the test weight in the hopper through its being too light, the spring-weight E² may be moved out toward the weight E', and by thus moving the said spring-weight farther away from the pivotal point a' of the balance the weight E' will be caused to exactly balance the test-weight in the hopper, while, if the weight E' is found to be too heavy, the spring weight is moved in toward the inner end of the tube E—that is, toward the pivotal point a' of the balance—so as to cause the said weight to exactly balance the test-weight in the hopper.

The manner in which the price-list operates in conjunction with the graduated cylinder is as follows: If it is desired to sell seven cents' worth of a commodity which sells at ten cents per pound, the weight F is moved out from the inner end of the cylinder seven tenths of the distance of the space which is divided into ten parts by its transverse lines, which is seven tenths of a pound or seven cents' worth of that particular commodity. The same principle is followed in selling commodities at different prices; eighty cents' worth of an article selling at eighty-five cents per pound being weighed by moving the annular pound-weight and price list to the point where the space which registers with the numeral 85 on the price-list is marked 80, and so on. By the use of the sliding graduated rod E, having the weight E', the use of separate weights is entirely dispensed with.

The auxiliary weight H, when its tube H' is inserted through the sleeve or bearing I, in the position shown in the drawings—that is to say, with the weight H on the same side of the pivotal point a' as the main weight F—may be used to take out tare from the object being weighed. For instance, if a certain proportion of a commodity—say, for example, honey—is to be weighed, and it is necessary or desirable to place the same in a vessel in the hopper, the said vessel may be first placed in the hopper, and balanced by the auxiliary weight H and the commodity itself may be then placed in the said vessel and weighed by the main weight F, as will be readily understood.

The auxiliary weight H may be used to assist in weighing the article or commodity in the hopper in combination with the weights F and E', thereby dispensing with loose weights, while, by reversing its tube H' in the sleeve or bearing I, it may be used in the following manner: If a certain quantity—say two pounds—of a commodity has been weighed in the scoop A' by the weights F and E', and the purchaser desires that a certain quantity—say three quarters of a pound—should be wrapped in a separate bundle from the remainder of the same, the weight H, in its reversed position, may be drawn out until its graduated tube H' indicates three quarters of a pound, thereby making the combined weight of the commodity in the scoop and the auxiliary weight H amount to two and three quarters pounds, while the weights F and E' on the opposite side of the pivotal point are adjusted to weigh two pounds, as before stated. Three-quarters of a pound of the commodity may be then removed from the scoop, this quantity being exactly determined by the reversed auxiliary weight H, it being only necessary to keep removing the commodity from the scoop until the scale is balanced, the one and three-quarters pound left in the scoop and the auxiliary weight adjusted at three-quarters of a pound exactly balancing the weights F and E' on the opposite side of the pivotal point; also, when it is desired to remove the scoop

A' and place the article to be weighed or the vessel in which it is to be placed directly upon the flat portion of the frame A, the auxiliary weight H may be used in its reversed position to balance the cylinder B in place of the scoop which has been removed.

When the slotted tube H is inserted through the collar I in the position shown in Fig. 1, and the said tube has been drawn out to indicate, say, one half pound, and a test one-half-pound weight has been placed in the scoop A', if the weight H is then found to be too light or too heavy to exactly balance the test-weight in the hopper the spring weight *b* is adjusted until the weight H exactly balances the test-weight, being adjusted in the same manner and for the same purpose as the spring weight E' in the tube E'.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of my improved combination counter-scale will be readily understood without requiring further explanation.

It will be seen that my invention dispenses with the use of separate weights, and may also be used to take out tare and subtract from or divide the commodity being weighed, while any proportion of a commodity with reference to its selling price may be accurately and conveniently weighed. It will be seen that my improved scale is also exceedingly simple in construction, and is therefore cheap to manufacture, and not liable to get out of order.

Having thus described my invention, what I claim and desire to secure by Letters Patent of the United States, is—

1. The combination, with the pivoted supporting-frame, of the graduated cylinder having the core adapted to be secured adjustably in the said supporting-frame, as and for the purpose shown and set forth.

2. The combination, with the pivoted supporting-frame, of the graduated cylinder having the core adapted to be adjusted longitudinally in a suitable bearing in the said supporting-frame, as shown, for the purpose set forth.

3. The combination, with the pivoted supporting-frame, of the core supporting the graduated cylinder carrying the main weight and adjustably secured in the forward portion of the said supporting-frame, and the rod having the end weight and adapted to be secured adjustably in the inner end of the said core, as shown, for the purpose set forth.

4. The combination, with the pivoted supporting-frame and the central core, of the graduated metallic tube having the weight on its outer end, and adapted to slide in the outer end of the said core, substantially as set forth.

5. The combination, with the pivoted supporting-frame and central core, of the graduated metallic tube having the weight on its outer end and provided with the adjustable interior spring-weight, for the purpose set forth.

6. The combination, with the pivoted supporting-frame and weighing-apparatus, of the adjustable and reversible auxiliary graduated tube having the end weight, and adapted to operate in the manner and for the purpose set forth.

7. The combination, with the pivoted supporting-frame and weighing-apparatus, of the adjustable and reversible auxiliary graduated tube arranged to operate in the manner and for the purpose set forth and having the adjustable interior spring-weight, as set forth.

8. The combination, with the pivoted supporting-frame and the adjustable core carrying the graduated cylinder having the adjustable weight and price-list, of the graduated adjustable tube having the weight on its outer end and provided with the adjustable spring-weight, for the purpose set forth.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

LYMAN B. GIBSON.

Witnesses:

WILLIAM W. WRIGHT,
JAMES D. CLINTON.

1213

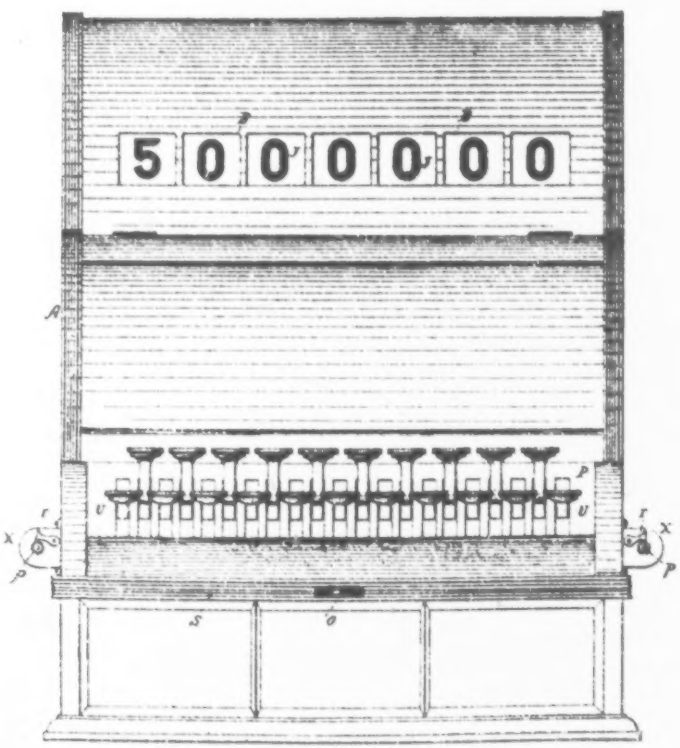
(No Model.) 731 4 Sheets—Sheet 1.

J. H. PATTERSON.

CASH INDICATOR AND REGISTER.

No. 383,006. Patented May 15, 1888.

Fig. 1.



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(No Model.) 4 Sheets—Sheet 2.

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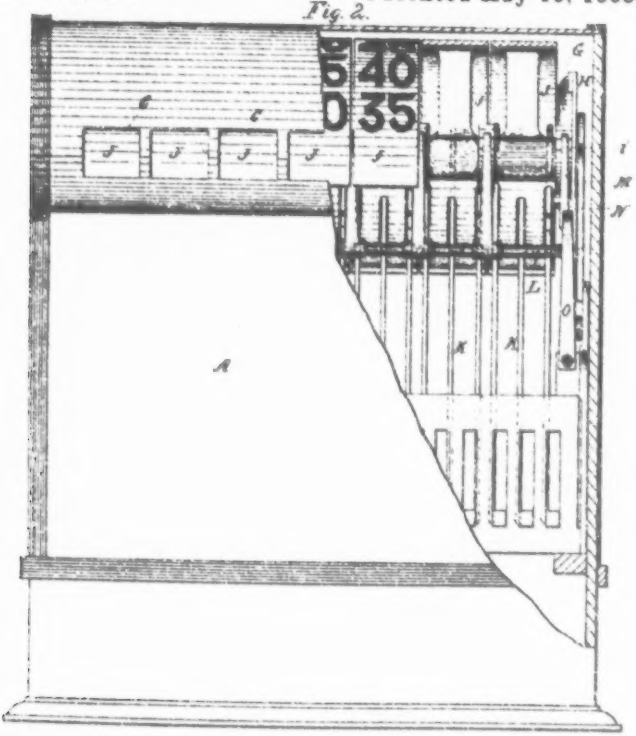
CASH INDICATOR AND REGISTER.

No. 383,006. Patented May 15, 1888.

Fig. 2.



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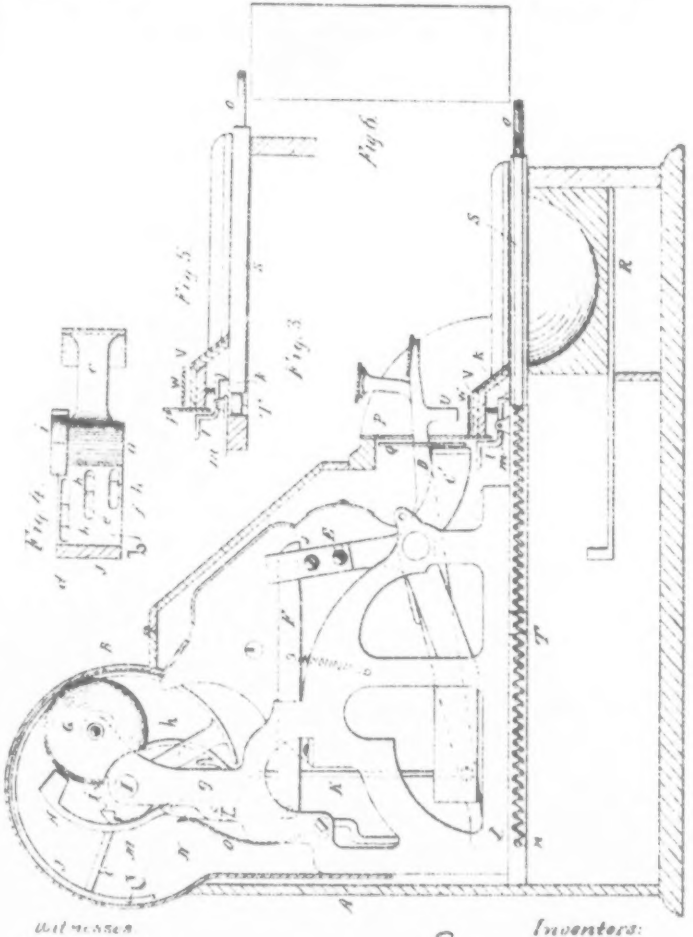
1215

(No Model.) 735 4 Sheets—Sheet 3.

J. H. PATTERSON.

CASH INDICATOR AND REGISTER.

No. 383,006. Patented May 15, 1888.



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1216

737

(No Model.) 4 Sheets—Sheet 4.

J. H. PATTERSON.

CASH INDICATOR AND REGISTER.

No. 383,006. Patented May 15, 1888.

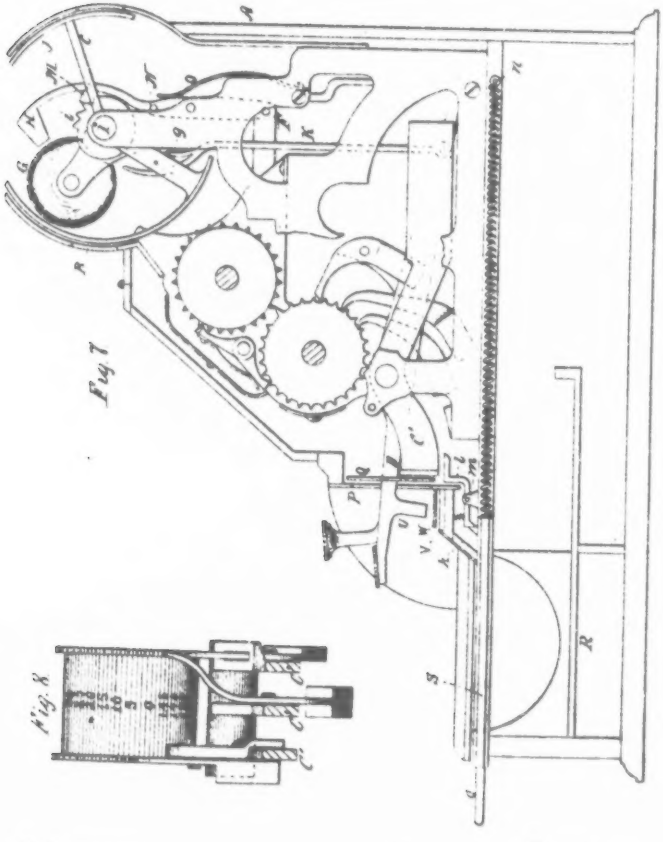

Fig 7

Fig 8

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1217

UNITED STATES PATENT OFFICE. 739

JOHN H. PATTERSON, OF DAYTON, OHIO.

CASH INDICATOR AND REGISTER.

SPECIFICATION forming part of Letters Patent No. 383,006, dated May 15, 1888.

Application filed January 19, 1887. Serial No. 224,765. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. PATTERSON, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Cash Registers and Indicators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to improvements in cash registers and indicators designed for the use of store-keepers and others as a means of accurately registering the total receipts for any given period of time and for indicating to the customers that the amounts paid have been registered by disclosing to their view such amounts on figured tablets.

It has for its object an improvement in this class of machines whereby their construction is simplified and their efficiency rendered more nearly perfect.

The novelty of my invention will be herein set forth, and specifically pointed out in the claims.

In the accompanying drawings, **Figure 1**, Sheet 1, is a front elevation of a machine embodying my present invention. Fig. 2, Sheet 2, is a rear elevation of the same with a portion of the case broken away. Fig. 3, Sheet 3, is a side elevation of the same with the end of the case removed. Fig. 4, Sheet 3, is a sectional plan view of one of the rocking tablets. Fig. 5, Sheet 3, is a sectional detail representing a modification of the sliding till-cover. Fig. 6, Sheet 3, is a plan view of one of the checks. Fig. 7, Sheet 1, is a side elevation of the machine with the end of the case removed and portions broken away to show the registering mechanism. Fig. 8, Sheet 4, is an enlarged rear elevation of one of the registering-wheels and its three operating-keys in section.

The same letters of reference are used to indicate identical parts in all the figures.

The machine proper is inclosed in a case or cabinet, A, of the usual or any suitable construction, and provided in this instance with a rounded or cylindrical top, with glass-covered reading openings B C at its front and back, respectively, through which the numbers on the rocking tablets are exposed to view.

The frame-work of the machine is substantially like that shown and described in Patents Nos. 318,485, of May 26, 1885, and 321,988, of July 14, 1885, and it is only necessary to say here that C is the vibrating frame; D, the operating-keys; E, the tripping-arms; G, the gong, and H the hammers.

The registering mechanism (illustrated in Figs. 7 and 8) is preferably that shown and described in Patent No. 351,160, of October 26, 1886, though any other suitable registering mechanism adapted to be operated by the keys to register the value of each key might be substituted.

Instead of a tablet-rod and tablet for each key, I provide the following mechanism: Upon a shaft, I, extending across the top of the frame-work, are strung a number of rocking tablets, J, which in this instance are composed of a hub, *a*, Fig. 4, two spokes or arms, *b c*, and a cylindrical periphery. The outer side of which bears the figures to be exposed through the openings B C. These rocking tablets are each free to turn independently of the other and are operated by rods or arms K, pivoted at their lower ends, one to each of the keys D, and to avoid the necessity of having as many rocking tablets as there are keys I have in the present instance grouped three keys and their rods K to each tablet in the following manner: Slots *d e f* are cut through the arm *b* of the tablet, through which the upper ends of the three rods K pass, respectively, and each of the rods K is provided with a finger, *g*, to form a catch or projection that engages with a pin, *h*, in each of the slots whenever its key is operated.

It will be observed that the pins *h* in the slots *d e f* are at a gradually decreasing distance from the axis of the tablet in the order named, for the following purpose and reasons: Beginning with the first tablet to the left, to which are connected by their rods K the first three keys, and supposing that these keys have a fixed value of five, ten, and fifteen cents, respectively, and inasmuch as the keys have an equal extent of travel and vibration, it will be seen that when the five-cent key is operated its catch or projection on the rod K, which passes through the slot *d*, would engage with the pin *h* at a point farthest from the axis of the tablet and would move it just sufficiently to expose the number 5 upon the tablet through the reading-openings B and C. The catch or

projection on the rod K of the ten-cent key by engaging the pin *h* of the slot *e*, which is nearer the axis, would move the tablet still farther to expose the number 10 through the reading-openings, while the rod K of the fifteen-cent key by engaging the pin *h* of the slot *f*, which is still nearer the axis, would move the tablet still farther to expose the number 15 through the reading-openings. The next rocking tablet would bear on each of its two opposite sides the numbers 20, 25, and 30 and be operated by the twenty, twenty-five, and thirty cent keys, in the manner above described. The next rocking tablet would bear on each of its two opposite sides the numbers 35, 40, and 45, as shown in Fig. 2, and be operated by the thirty-five, forty, and forty-five cent keys, in the same manner, and so on throughout the series.

Instead of placing the pins *h* at varying distances from the axis, they might be at an equal distance from it and the same result be accomplished by varying the distance of the fingers *g* from the keys D. Thus the finger *g* on the rod of the five cent key might be located at a point nearer the keys than the fingers on the rods of the ten and fifteen cent keys, the finger on the rod of the ten cent key being the next nearest and that on the rod of the fifteen-cent key the farthest, so that were the five cent key to be operated the finger *g* upon its rod K would not engage the pin *h* of the slot *d* until the rear end of the key had been elevated to almost its farthest limit, and thus the tablet would be moved only sufficiently to expose the number 5 through the reading opening. When the ten-cent key was operated, the finger *g* on its rod K would engage with the pin *h* in the slot *e* at an earlier point in the operation of the key and would move the tablet still farther to expose the number 10 through the reading-openings. When the fifteen cent key was operated, the finger *g* on its rod K would engage with the pin *h* in the slot *f* as soon as the front of the key had been slightly depressed, and when the key was depressed to its farthest limit would move the tablet far enough to expose the number 15 through the reading-openings, and so on through the series. In this instance the arm *h* is made sufficiently large to constitute a weight for automatically returning the tablet to its normal position, though any form of weight or even a spring might be employed for this purpose.

To hold the tablet with its number exposed after any key has been operated, I provide a series of ratchet-teeth or retaining-points, *i*, upon the hub of each of the tablets, and a shaft, L, Fig. 2, which extends across the frame and carries a series of dogs, M, one for each of the tablets, and engaging with its ratchet-teeth *i*. At one end of said shaft, and secured thereon, is an arm, N, whose lower end is pivoted to the draw-bar F, and whose upper end is provided with the gong-hammer H.

O is any suitable retracting spring, applied to the arm N for throwing the same back and causing the hammer to strike the gong whenever any key has been operated to its fullest extent. It results from this construction that whenever any key D, the series of which rest and are supported at their forward ends upon the frame C, is operated the frame C, in being depressed through the medium of the arm E, secured to or integral with said frame, draws forward the bar F and swings back the arm N, thereby oscillating the shaft L and throwing back the dogs M out of engagement with the ratchet-teeth *i* of all the tablets. As soon as the key has reached its limit of depression and the catch *j* of the bar F has been released from the arm E, the tablet moved by said key is caught and held by the re engagement of its dog M with one of the ratchet-teeth *i*. In this instance, where there are three keys arranged to each tablet, there are four notches forming the ratchet-teeth *i*. The lowest of these, when engaged by its dog, as seen in Fig. 3, holds the tablet in its normal position of rest, with a blank or 0 exposed through the reading-openings. The operation of any key of a set of the lowest value moves the tablet into such a position that the dog in its re engagement enters the first notch above and holds the tablet with the number corresponding to that key exposed. The operation of the next higher key of the same set so moves the tablet that the dog in re engaging enters the second notch above the lowest, and so on. It also results from this construction that whenever any key is operated the exposed tablet or tablets of previously-operated keys are, by the operation of the first-mentioned key, immediately released and dropped back to their normal position above referred to.

It is of course obvious that there may be as many rocking tablets as there are keys, and it is likewise obvious that two or more keys may be connected to the same tablet instead of three keys, as I have shown and described. It is also evident that one of the reading-openings I have shown and described might be dispensed with, as well as that part of the tablet containing the numbers to be exposed through such opening.

That part of my invention above described which relates to the connection of a group of two or more keys to a single tablet is applicable to other forms of tablets than the one shown and described in this specification.

The construction of the arm E, draw-bar F, and its latch *j* is shown and described in Patent No. 321,988, of July 14, 1885. It will thus be seen that, as in previous machines of this class, the operation of any key to its farthest limit sounds the gong, operates the registering mechanism, and exposes to view the number on the tablet corresponding to the value of the key operated.

The next feature of my invention is shown more particularly in Fig. 3, where each key is provided, just within the slotted front plate, P, of the machine, with a flat guard-plate, Q, extending above and below the key and of a

width, greater than that of the slot through which the key projects, this guard being attached to and moving with the key, whereby the insertion of any instrument adapted to hook over the top of the vibrating frame and depress the same is prevented. Without this guard it is apparent that an instrument might be inserted to hook over the top of the vibrating frame, and, supposing the immediately preceding purchase had been of the same amount as the present one and a tablet therefore already exposed which corresponds to the amount of the present purchase, the operator, by pressing down the vibrating frame, might sound the gong without registering the amount of the purchase, and thus deceive the customer.

The next feature of my invention relates to the lid and the mechanism for automatically removing the lid to expose the same whenever any key is operated and is illustrated in Figs. 3 and 5, where the lid R is an extension of the front of the case and is provided with a sliding lid, S, having at its rear, preferably near the middle and on its upper side, a stop, *k*, with which a spring latch, *l*, pivoted, as at *m*, engages to hold the lid closed over the till. The latch is so constructed that a portion of it extends under the frame C in such manner that the depression of the figure by the operation of the keys vibrates the latch, so as to release the stop *k*. Springs T on each side attached to the lid at its rear end and to stops *n* at the back of the case or till compartment, draw in the lid by their retraction whenever the stop *k* is released, and thus uncover the till. By drawing the lid out by means of a ring, *o*, the stop *k* becomes automatically engaged with the latch *l* to relock the lid, as will be readily understood.

If desired, the construction in Fig. 5 may be employed, where the lid, instead of being drawn in by the springs, is thrown out to uncover the till whenever a key is operated.

The remaining feature of my invention is illustrated in Figs. 1, 3, and 6, where each key is provided (in this instance on its under side and just outside of the front plate, P,) with a type, U, bearing a number corresponding to the value of the key. Just under these types and extending across the front of the machine and over a rubber bed strip, V, is an inking-ribbon, W, whose ends are wound upon spools secured within cases X at each side, as shown in Fig. 1. Each spool spindle is provided on the outside of the case with a ratchet, *p*, with which a pivoted dog, *r*, engages to hold the ribbon taut and enable it to be shifted sidewise to expose fresh inking surface.

In addition to the dogs just referred to for holding the ribbon taut, any sort of weight devices may be applied to it above the rubber bed-strip V, as will be readily understood. The purpose of this mechanism is as follows: It is intended that each machine be provided with blocks of paper checks having printed thereon the proprietor's name or any other desired matter, which checks are consecutively numbered, so that whenever the machine is to be operated to register and indicate a purchase the operator, tearing off the top one, inserts it beneath the ribbon W, under the key to be operated, in such manner that the depression of the key causes the number borne by said key to be printed upon the check. One of these checks is represented in Fig. 6, and they are intended to be used in cases where a cashier other than the operator of the machine takes to the money. In such event the clerks, waiters, bartenders, or other operators have convenient access to the machine, and they print a check for each customer, while the same operation registers the amount. The customer gives this check to the cashier, together with the amount of money indicated by it. At the close of business for a day or other given period, when the cash is counted, the total amount received must correspond with the amount registered in the machine, and also, of course, with the amount of the checks received by the cashier.

The purpose of consecutively numbering the checks is to provide an additional safeguard against dishonesty on the part of the cashier by preventing his destroying any of the checks without detection.

It is of course apparent that the inking ribbon might be dispensed with and the types be figured dies, in which event corresponding dies or matrices would be employed in place of the rubber strip V in such manner as to stamp or emboss the number upon the checks.

I am aware that it has heretofore been proposed to construct a registering and indicating machine embodying a series of keys of fixed values, a stationary dial having upon its face numbers corresponding to the numbers on the several keys, a movable disk or plate arranged over the face of the said numbered dial and having a reading opening adapted to expose one number on the dial at a time, and connecting mechanism between the keys and the said movable disk, said elements being so arranged as that when a key was struck the movable reading-plate would be rotated a distance sufficient to bring its opening opposite the number on the stationary dial corresponding to the number on the key so struck, and I therefore do not claim such construction to be of my invention. It differs from my invention in that the number corresponding to the key struck is not always exposed at the same point, but at different points on the stationary dial, thereby rendering it very awkward to read, especially where several dials are employed to respectively indicate dollars and cents, whereas in my invention a stationary reading-opening is employed and the numbers to be exposed are brought in succession thereto, and where several letters are employed their reading-openings are enabled to be located immediately adjacent to and on a line with each other, so that the numbers on all the tablets may be read together at a glance.

Having thus fully described my invention, I claim—

1. In an indicating machine, the combination of a series of keys of fixed values, a movable indicating-tablet provided with a series of numbers corresponding to those represented by the series of keys, a stationary reading-opening, mechanism between the keys and the tablet for actuating and controlling the extent of movement of the tablet when a key is operated, and a locking and releasing device for the movable tablet controlled by all the keys, whereby when a key is actuated the tablet will be moved to bring to the reading opening the number on it corresponding to the number represented by said key, and when any other key of the series is actuated the tablet will be released and moved so as to expose at the reading-opening the number represented by said last mentioned key, substantially as described.

2. In an indicating machine, the combination of a series of keys of fixed values, a rocking indicating-tablet provided with a series of numbers corresponding to those represented by the series of keys, a stationary reading opening, mechanism between the keys and the tablet for actuating and controlling the extent of movement of the tablet when a key is operated, and a locking and releasing device for the rocking tablet controlled by all the keys, whereby when a key is actuated the tablet will be rocked to bring to the reading opening the number on it corresponding to the number represented by said key, and when any other key of the series is actuated the tablet will be released and rocked, so as to expose at the reading-opening the number represented by said last mentioned key, substantially as described.

3. In a registering and indicating machine, the combination of a series of keys of fixed values, a registering mechanism operated thereby, a movable indicating tablet provided with a series of numbers corresponding to those represented by the series of keys, a stationary reading opening, mechanism between the keys and the tablet for actuating and controlling the extent of movement of the tablet when a key is operated, and a locking and releasing device for the tablet controlled by all the keys, whereby when a key is actuated the tablet will be moved to bring to the reading opening the number on it corresponding to the number represented by said key, and when any other key of the series is actuated the tablet will be released and moved so as to expose at the reading-opening the number represented by said last mentioned key, and whereby, also, the registering mechanism will be operated upon the actuation of each key, substantially as described.

4. In a registering and indicating machine, the combination of a series of keys of fixed values, a registering mechanism operated thereby, a rocking indicating tablet provided with a series of numbers corresponding to those represented by the series of keys, a stationary reading-opening, mechanism between the keys and the tablet for actuating and controlling the extent of movement of the rocking tablet when a key is operated, and a locking and releasing device for the tablet controlled by all the keys, whereby when a key is actuated the tablet will be rocked to bring to the reading-opening the number on it corresponding to the number represented by said key, and when any other key of the series is actuated the tablet will be released and dropped, so as to expose at the reading-opening the number represented by said last-mentioned key, and whereby, also, the registering mechanism will be operated upon the actuation of each key, substantially as described.

5. In an indicating-machine, the combination of a series of movable indicating tablets each provided with a series of numbers, a series of keys of fixed values for each movable indicating tablet, stationary openings through which the numbers on the tablets may be read, mechanism between each series of keys and its co-operating tablet for actuating and controlling the extent of movement of the tablet when any key of the series is operated, and a locking and releasing device for each movable tablet controlled by all the keys of the particular series, whereby when two or more keys of different series are actuated the corresponding tablets will be moved so as to bring to the reading opening the numbers on the several tablets corresponding to the keys that are actuated.

6. In an indicating-machine, the combination of a series of rocking indicating tablets each provided with a series of numbers, a series of keys of fixed values for each rocking indicating tablet, stationary openings through which the numbers on the rocking tablet may be read, mechanism between each series of keys and its co-operating rocking tablet for actuating and controlling the extent of movement of the tablet when any key of the series is operated, and a locking and releasing device for each rocking tablet controlled by all the keys of the particular series, whereby when two or more keys of different series are actuated the corresponding tablets will be rocked, so as to bring to the reading opening the numbers on the several rocking tablets corresponding to the keys that are actuated, substantially as described.

7. In an indicating machine, the combination of a series of keys of fixed values, a movable indicating tablet provided with a series of numbers in duplicate corresponding to the numbers represented by the keys, two stationary reading openings, and intermediate mechanism between the keys and the tablet, by which, when either of the keys is actuated the tablet will be moved a distance sufficient to bring into view simultaneously at the two reading openings the duplicates of the number represented by the key actuated, substantially as described.

8. In an indicating machine, the combina-

tion of a series of keys of fixed values, a rocking indicating-tablet provided with a series of numbers in duplicate corresponding to the numbers represented by the keys, two stationary reading-openings, and intermediate mechanism between the keys and the tablet, by which, when either of the keys is actuated, the tablet will be rocked a distance to bring into view simultaneously at the two reading-openings the duplicates of the numbers represented by the key actuated, substantially as described.

9. In a cash register and indicator provided with registering mechanism and a series of keys for operating said mechanism, the combination of a series of rocking tablets arranged upon a common axis, and a series of lifting-arms connected to said keys and arranged to engage with said tablets when operated, but normally out of operative contact with them, whereby the operation of any one of said keys elevates its lifting-rod to move its tablet, substantially as and for the purpose described.

10. In a cash register and indicator provided with registering mechanism and a series of keys for operating said mechanism, the combination of a series of rocking tablets arranged upon a common axis, positively-acting retaining devices for holding said tablets in their normal and in their actuated positions, and a series of lifting-arms connected to said keys and arranged to engage with said tablets, whereby the operation of any one of said keys elevates its lifting-rod to move its tablet, and whereby said tablet when so moved is held with its number exposed to view, substantially as described.

11. In a cash register and indicator provided with registering mechanism and a series of keys for operating said mechanism, the combination of a series of weighted rocking tablets arranged upon a common axis and a series of lifting-arms connected to said keys and arranged to engage with said tablets when operated, but normally out of operative contact with them, whereby the operation of any one of said keys elevates its lifting-rod to move its tablet, substantially as and for the purpose described.

12. In a cash register and indicator provided with registering mechanism and a series of keys for operating said mechanism, the combination of a series of weighted rocking tablets arranged upon a common axis, retaining-devices for holding said tablets in their actuated positions, and a series of lifting-arms connected to said keys and arranged to engage with said tablets when operated, but normally out of operative contact with them, whereby the operation of any one of said keys elevates its lifting-rod to move its tablet, and whereby said tablet, when so moved, is held with its number exposed to view, substantially as described.

13. In a cash register and indicator provided with a series of tablets for exposing to view the amount of each purchase, a registering mechanism for registering the amount of said purchase, and a series of keys of fixed values for operating said tablets and registering mechanism simultaneously, a series of types, one secured to each key and bearing a number corresponding to the value of the key, and inking mechanism or its equivalent, whereby any one of the keys may be operated to simultaneously expose its tablet, register its value, and print its number on a check placed under said type.

14. In a cash register and indicator provided with a series of tablets for exposing to view the amount of each purchase, a registering mechanism for registering the amount of said purchase, a series of keys of fixed values for operating said tablets and registering mechanism simultaneously, and a casing inclosing all said parts, a series of types, one secured to each key outside the casing and bearing a number corresponding to the value of the key, whereby any one of the keys may be operated to simultaneously expose its tablet, register its value, and print its number on a check placed under said type, substantially as described.

15. In a cash register and indicator provided with a series of tablets for exposing to view the amount of each purchase, a registering mechanism for registering the amount of said purchase, and a series of keys of fixed values for operating said tablets and registering mechanism simultaneously, a series of types, one on the under side of the front of each key and bearing a number corresponding to the value of the key, and inking mechanism or its equivalent, whereby any one of the keys may be operated to simultaneously expose its tablet, register its value, and print its number on a check placed under said type.

16. In a cash register and indicator, the combination, with a vibrating frame and a series of operating-keys for depressing said frame, of a till, a spring-latch, a sliding till-cover engaged by said latch, and springs for operating said cover to expose the till whenever one of said keys is operated, substantially as described.

17. In a cash register and indicator, the combination, with the operating-keys D and lifting-rods K, provided with fingers g_4 of the rocking tablets J, with which said fingers are adapted to engage, substantially as and for the purpose described.

18. In a cash register and indicator, the combination, with the operating-keys D and lifting-rods K, provided with fingers g, of the rocking tablets J, with which said fingers are adapted to engage, the shaft L, provided with dogs M, catches upon the hubs of the tablets, and connecting-mechanism for uniting the shaft L to the vibrating frame C, substantially as and for the purpose specified.

19. The combination, with a casing having a reading opening or slot therein and a tablet having a series of figures or characters thereon adapted to be exposed at said opening, of a se-

ries of keys indicating amounts corresponding to those on the tablet and suitable projections connected to the keys for operating the tablet arranged at varying distances from the said tablet corresponding to the distance necessary to move it to expose the particular character represented by the key, substantially as described.

20. In a cash register and indicator, the combination, with a casing having a reading opening or slot therein and a tablet having a series of amounts indicated thereon adapted to be exposed at said opening, of a series of keys indicating amounts corresponding to those on the tablet, a registering mechanism for each key, and suitable projections connected to the keys for operating the tablet, arranged at varying distances from said tablet corresponding to the distance necessary to move the latter to expose the particular amount represented by the key, substantially as described.

21. In a cash register and indicator, the combination, with the casing having the reading-opening, and the pivoted segmental tablet having a series of amounts indicated thereon adapted to be exposed at said opening, of a series of keys representing various amounts, a registering mechanism for each key, and projections connected to the keys for operating the tablet and arranged at varying distances from it corresponding to the distance necessary to move it to expose the particular amount represented by the key, substantially as described.

22. The combination, with the casing having reading-openings at front and rear, and a pivoted segmental tablet having two corresponding series of amounts indicated thereon, of a series of keys corresponding to the amounts on the tablet and having projections for operating the latter at various distances from said tablet corresponding to the distance necessary to move it to expose the particular amount represented by the key, substantially as described.

23. The combination, with a gravitating tablet pivoted upon a horizontal axis or shaft and provided with a face substantially parallel with said axis, and having characters indicated thereon, of a series of keys pivoted upon an axis parallel with said tablet axis, a stationary reading opening, mechanism between the keys and the tablet for actuating and controlling the extent of movement of the tablet when the keys are actuated, and a locking and releasing device for the movable tablet controlled by all the keys, substantially as and for the purpose described.

24. The combination, with a gravitating rocking tablet pivoted upon an axis or shaft and provided with a face substantially parallel with said axis, and having characters indicated thereon, of a series of keys pivoted upon an axis parallel with said tablet axis, a stationary reading-opening, mechanism between the keys and tablet for actuating and controlling the extent of movement of the tablet when the keys are operated, and a locking and releasing device for the movable tablet controlled by all of the keys, substantially as and for the purpose described.

25. In a registering and indicating machine, the combination of a series of keys of fixed values, registering mechanism operated by said keys for registering the amount of each key operated, and a series of pivoted rocking tablets having faces substantially parallel with their pivotal centers, upon which a character or characters are indicated, and connections between said keys and tablets, whereby the operation of any of the keys registers the value of the key and moves the tablet to expose to view a number corresponding to the value of the key operated, substantially as described.

26. In a registering and indicating machine, the combination of a series of keys of fixed values, registering mechanism operated by said keys for registering the amount of each key operated, and a series of pivoted rocking tablets each having a face substantially parallel with its axis, each of said tablets being connected to a group of two or more keys and provided with a series of numbers upon the face mentioned corresponding to the value of one of the keys, whereby the operation of any one of the keys of a group registers the value of said key and moves the tablet to expose to view the number corresponding to the value of the said key.

27. In a registering and indicating machine, the combination of a series of keys of fixed values, registering mechanism operated by said keys for registering the amount of each key operated, and a series of pivoted rocking tablets each having a face substantially parallel with its axis, with connecting mechanism and a series of retaining devices for releasing and locking said tablets, whereby the operation of any one of the keys registers the value of the key operated and holds the tablet with said number exposed to view, and whereby the operation of another key releases the exposed tablet.

28. In a cash indicator, the combination of a series of keys of fixed values, a movable indicating-tablet provided with a series of numbers corresponding to those represented by the keys, a stationary reading opening, connecting mechanism between said keys and movable tablet for actuating and controlling the extent of movement of said tablet when a key is operated, a ratchet on said tablet, and a locking-dog engaging therewith, a vibrating bar actuated by each of the keys, and tripping mechanism actuated by said vibrating bar and operating said locking dog, substantially as and for the purpose described.

29. In a cash-indicator, the combination of a series of keys of fixed values, a rocking indicating-tablet provided with a series of numbers corresponding to those represented by the keys, a stationary reading-opening, connecting mechanism between said keys and rocking tablet for actuating and controlling the extent of movement of said tablet when a

key is operated, a ratchet secured to the hub of said rocking tablet, a locking-dog engaging with said ratchet, a vibrating bar actuated by each of the keys, and tripping mechanism actuated by said vibrating bar and operating said locking-dog, substantially as and for the purpose described.

30. In a cash-indicator, the combination of a series of keys of fixed values, a movable indicating-tablet provided with a series of numbers corresponding to those represented by the keys, a stationary reading-opening, connecting mechanism between said keys and movable tablet for actuating and controlling the extent of movement of said tablet when a key is operated, a ratchet on said tablet, and a locking-dog engaging therewith, a gong and gong-hammer, a vibrating bar actuated by each of the keys, and tripping mechanism actuated by said vibrating bar and operating said locking-dog and gong-hammer, substantially as described.

31. In a cash-indicator, the combination of a series of keys of fixed values, a movable indicating-tablet provided with a series of numbers corresponding to those represented by the keys, a stationary reading-opening, suitable projections actuated by the keys for operating the tablet and arranged at varying distances from said tablet corresponding to the distance necessary to move it to expose the particular number represented by the key operated, a ratchet on said tablet, and a locking-dog engaging therewith, a vibrating bar actuated by each of the keys, and tripping mechanism actuated by said vibrating bar and operating said locking-dog, substantially as and for the purpose described.

32. In a cash register and indicator, the combination of a series of keys of fixed values, registering mechanism actuated by said keys, a movable indicating-tablet provided with a series of numbers corresponding to those represented by the keys, a stationary reading-opening, connecting mechanism between said keys and movable tablet for actuating and controlling the extent of movement of said tablet, a ratchet on said tablet, and a locking-dog engaging therewith, a vibrating bar actuated by each of the keys, and the tripping mechanism actuated by said vibrating bar and operating said locking-dog, substantially as and for the purpose described.

33. In a cash register and indicator, the combination of a series of keys of fixed values, registering mechanism operated by said keys, a movable indicating-tablet provided with a series of numbers corresponding to those represented by the keys, a stationary reading-opening, suitable projections actuated by the keys for operating the tablet and arranged at varying distances from said tablet corresponding to the distance necessary to move it to expose the particular number represented by the key operated, a ratchet on said tablet, and a locking-dog engaging therewith, a vibrating bar actuated by each of the keys, and tripping mechanism actuated by said vibrating bar and operating said locking-dog, substantially as and for the purpose described.

34. In a cash register and indicator, the combination of a series of keys of fixed values, registering mechanism operated by said keys, a movable indicating-tablet provided with a series of numbers corresponding to those represented by the keys, a series of lifting-arms actuated by said keys and arranged to engage with said tablet, a ratchet on said tablet, and a locking-dog engaging therewith, a vibrating bar actuated by each of the keys, and tripping mechanism actuated by said vibrating bar and operating said locking-dog, substantially as and for the purpose described.

35. In a cash register and indicator, the combination of a series of keys of fixed values, registering mechanism operated by said keys, a movable indicating-tablet provided with a series of numbers corresponding to those represented by the keys, a series of lifting-arms actuated by said keys and provided with projections at varying distances from said tablet, and arranged to engage therewith, a ratchet on said tablet and a locking-dog engaging therewith, a vibrating bar actuated by each of the keys, and tripping mechanism actuated by said vibrating bar and operating said locking-dog, substantially as and for the purpose described.

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1894

747

(No Model.) 4 Sheets—Sheet 1

W. KOCH

CASH INDICATOR AND RECORDER.

No. 398,625. Patented Feb. 26, 1889.

Fig. 1.

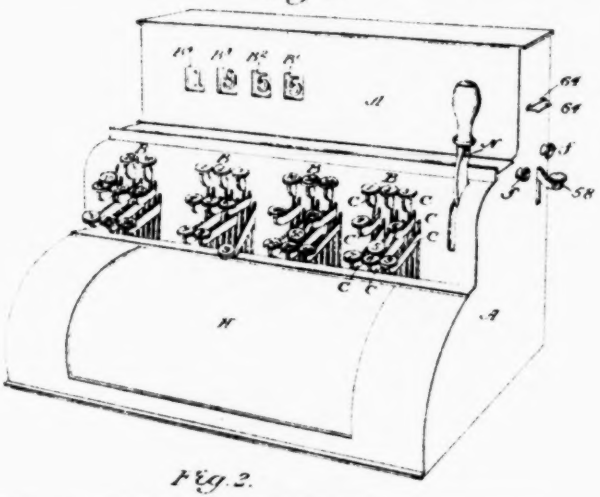
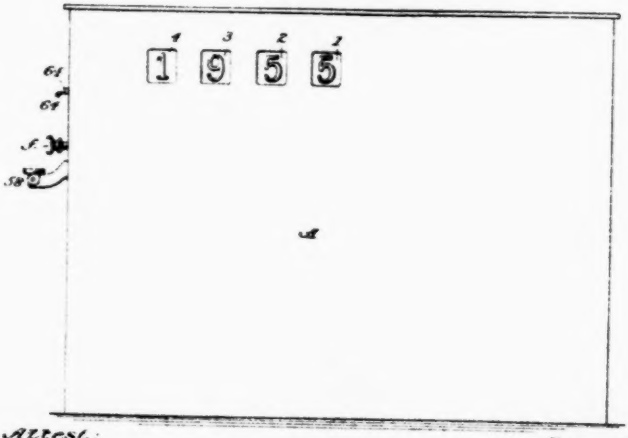


Fig. 2.



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(No Model.) 4 Sheets—Sheet 2

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CASH INDICATOR AND RECORDER.

No. 398,625. Patented Feb. 26, 1889.

Fig. 9.

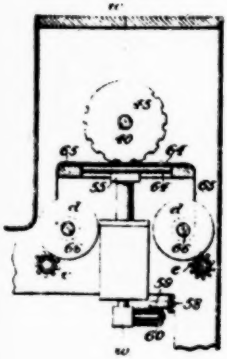


Fig. 3.

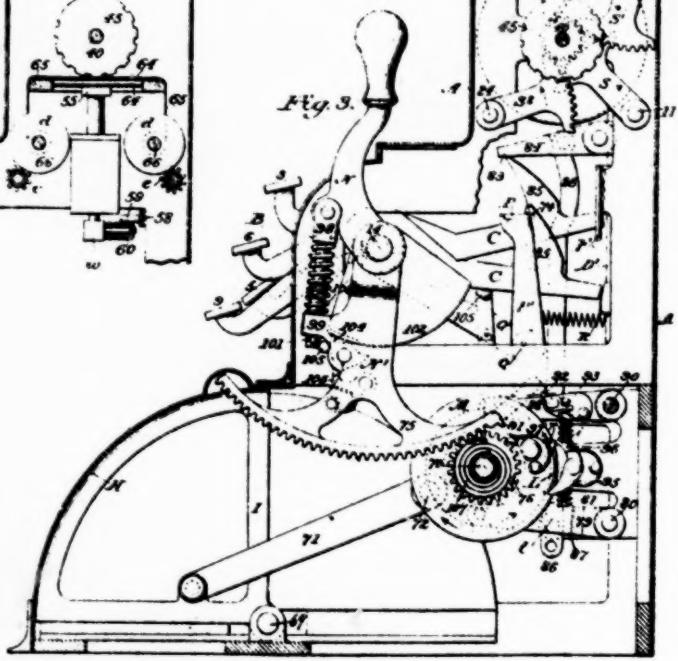
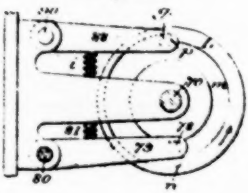


Fig. 12.



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751

(No Model.) 4 Sheets—Sheet 2

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CASH INDICATOR AND RECORDER.

No. 398,625. Patented Feb. 26, 1889.

Fig. 10.

Fig. 4.

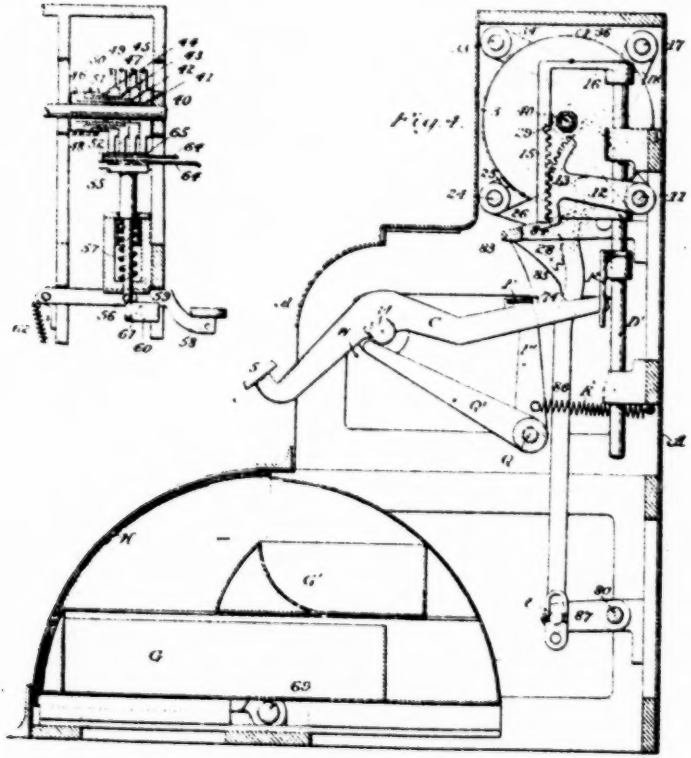

Fig. 11.

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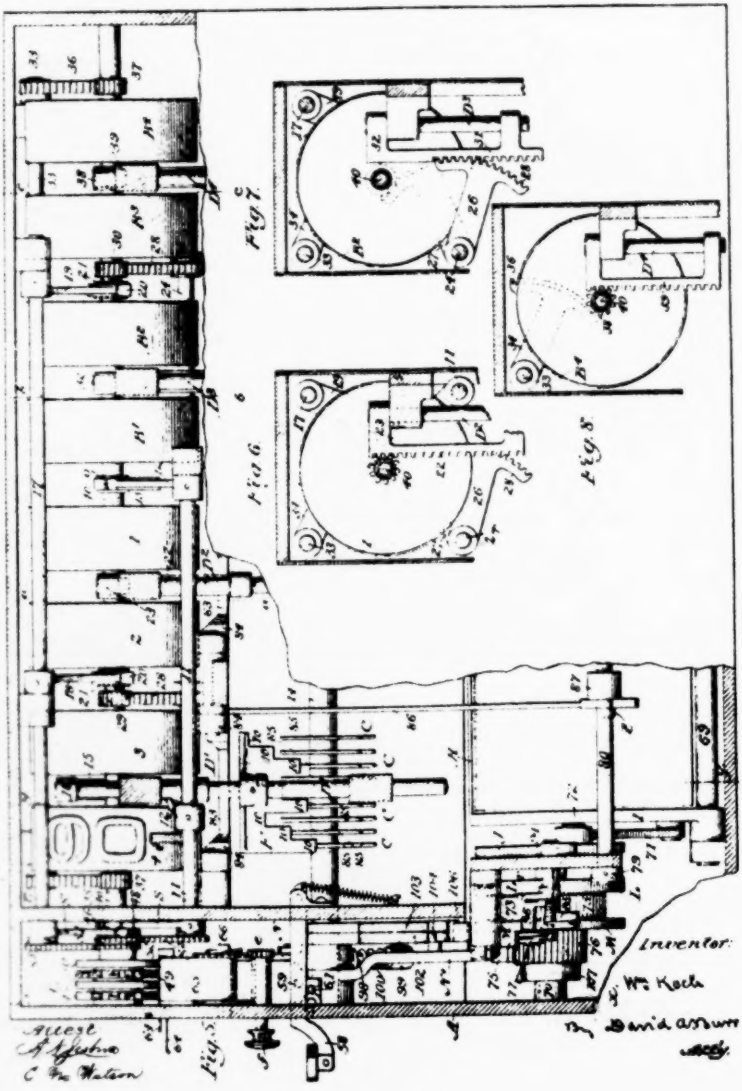
(No Model.)

4 Sheets—Sheet 4

W. KOCH.

CASH INDICATOR AND RECORDER.

No. 398,625. Patented Feb. 26, 1889.



1888

UNITED STATES PATENT OFFICE.

WILLIAM KOCH, OF NEW YORK, N. Y.

CASH INDICATOR AND RECORDER.

SPECIFICATION forming part of Letters Patent No. 398,625, dated February 26, 1889.

Application filed March 23, 1888. Serial No. 268,195. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM KOCH, of the city, county, and State of New York, have invented certain new and useful Improvements in Cash-Indicating and Check-Printing Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification, in which—

Figure 1 is a view in perspective of the front of a cash-indicating machine embodying my improvements; Fig. 2, a rear elevation thereof. Fig. 3 is a vertical section in the line *x x* of Fig. 5 with the printing mechanism omitted; Fig. 4, a vertical section in line *y y* of same figure. Fig. 5 is a rear elevation, on an enlarged scale, of the machine with a portion of the casing broken away. Figs. 6, 7, and 8 are detached transverse vertical sections on the lines *a a*, *b b*, *c c*, respectively, of Fig. 5, each looking to the right. Fig. 9 is a detail vertical section in line *x x* of Fig. 5 of the printing mechanism alone; Fig. 10, a transverse section in line *w w* of Fig. 9. Fig. 11 is a detail view, in elevation, of one face of the controlling-disk in the lid-actuating mechanism; and Fig. 12, a similar view of its opposite face and of the pivoted spring-actuated arms which govern it.

Similar letters and numerals indicate like parts in all of the figures.

My invention relates to that class of cash indicating and registering machines in which a cash receptacle or drawer is combined with the indicating apparatus.

In the improved machine the cash-receptacle is closed by a spring-actuated lid and the keys are arranged in a series of groups.

The invention consists in a combination and arrangement of mechanism, substantially as is hereinafter described and claimed, whereby, in the first place, the play of any one of the keys will operate to turn one or more indicating-wheels, a pair of corresponding wheels being by preference located, respectively, at each end of the machine and geared together so as to properly indicate the number designated by the operating key simultaneously at the front and at the rear of the machine, and then automatically lock the same and simultaneously release the spring-actuated lid, so that it will automatically cover and close the cash-receptacle in the base of the machine and become locked in its closed position; and, in the second place, the movement of a suitable handle will operate automatically to release each actuated key and its indicating-wheel and allow them to return automatically to their first or normal positions and simultaneously wind up the spring which actuates the lid, unlock said lid, and then release it, so that it shall automatically fly open.

It consists, furthermore, in the combination, substantially as hereinafter set forth and claimed, of printing-wheels with the indicating-wheels, so that the one shall move simultaneously with the other and bring in proper order to a line of print numbers corresponding with those exhibited by said wheels, and also of mechanism for obtaining an impression of said numbers upon a check or strip of paper from the printing-wheels.

In the accompanying drawings, A represents the outer casing of the entire machine; B B, groups of keys, each group consisting, preferably, of nine keys arranged, for convenience and compactness, as is customary, in three rows of three each.

The machine shown is constructed with four groups of keys, the first group being made to indicate from 1 to 9 cents, the second from 10 to 99 cents, the third from 1 to 9 dollars, and the fourth from 10 to 99 dollars, so that with this machine the amount, from a cent to $99.99, received in any one payment may be brought to view upon the indicators and registered and be also printed upon a suitable check.

The keys C C C are all pivoted, as is usual, upon a common horizontal shaft, 14, and each key constitutes a lever of the first order with the shaft as its fulcrum. This shaft is mounted to rock in its bearings and is fitted with a hand-lever, N, by means of which it may be actuated.

Whenever any one key in a group is operated or played—*i. e.*, is elevated at its inner end by the depression of its outer end. (See key 5, Fig. 4)—it is automatically upheld and locked in its elevated position by means of a transverse plate or strip, P, mounted upon arms P' P', projecting between the key-shaft

14 and the inner ends of the keys from a rock-shaft, Q, which is parallel with the key-shaft 14 and below the same. The locking-strip P swings upon said rock-shaft as its axis, so that it may engage a notch, 74, cut in the proximate edge of a key plate or finger, 85, made to project upward from each key-lever near its inner end whenever by the elevation of said end the notch is brought into register with said strip, as shown in Fig. 4. The automatic engagement of the strip with the key-plate 85 is enforced by means of a spring, R. The strip P is withdrawn from its engagement with the notch 74 in the key-plate 85 by the movement of an arm, Q', projecting radially from the rock-shaft Q under the key-shaft 14 in position to be engaged and depressed by a toe, W, upon said shaft whenever the shaft is rocked by a movement of its hand-lever N. (See Fig. 3.)

The several keys in each group B of keys are made to actuate by their play or oscillation a separate vertical rod, D', D², &c., mounted to reciprocate in suitable bearings at the rear of the machine, the rear end of each key being made, when the key is played by a depression of its front end, to bear against a cross-plate, F, secured to the rod. (see D', Fig. 5,) so as to operate thereby to lift the rod. The lower edge of this plate F is, however, cut away irregularly, so as to afford a different bearing-point, 10, for each key. These bearing-points are formed differentially (see Fig. 5) and so adjusted that the key indicating the number 1 may not strike its bearing 10 until the movement or play of the key is nearly completed, and the length of movement which it imparts to the rod D' after contact with said bearing is taken as a unit of which the different lengths of stroke imparted to the same rod by the remaining eight keys are severally multiples. The contact of the 5-key, for instance, with its bearing 10 on the plate F, is attained at a point where in subsequently completing its stroke the key will necessarily move the rod D' five times the distance which key 1 will move it.

A series of wide-faced wheels, 4 3 2 1 and B', B², B³, and B⁴, are mounted in the upper portion of the machine to revolve independently on a common horizontal axis, 40, and the digits 1 to 9 are marked upon the periphery of each, the corresponding with the digits of the several groups of keys,) with the addition thereto of a cipher. These eight indicating-wheels are divided into two sets of four each, and the figures on the four to the left of the front of the machine are made to appear singly through a longitudinal front opening in the casing, as shown in Fig. 1, while those on the remaining four appear in like manner at an opening to the left on the rear face of the machine, as shown in Fig. 2.

The eight wheels are so geared as to move in pairs. Thus the two wheels 1 and B', which are in view at the extreme right of both the front and rear sight-openings and which indicate units, are made to revolve in unison. The next two wheels in order to the left, 2 and B², which indicate tens, are in like manner made to revolve together, as are also the two hundreds-wheels, 3 and B³, and the two thousands-wheels, 4 and B⁴. The two units-wheels 1 and B', being next to each other, are both fitted upon a common axial shaft and are made to revolve by the reciprocation of the vertical rod D', actuated by the first or units group of keys through the intervention of a horizontal rock-shaft, 11, mounted in the frame of the machine outside of the wheels. This rock-shaft 11 is fitted with two radial arms, 12 12, extending inwardly, the one between the wheels 1 and B' and the other below the wheels and alongside of the upper end of the rod D'. These arms terminate, respectively, in similar segmental racks, 13 13, the one being made to gear with a pinion, as upon the axial shaft of said wheels 1 and B' and the other with a vertical rack, 15, carried by the rod D', to which it is attached by means of a cross-arm, 16. (See Fig. 4.)

The two tens-wheels 2 and B² revolve upon independent axles, but are geared together by means of a rock-shaft, 17, (see Fig. 5,) mounted parallel with the shaft 11 at the top and rear of the frame of the machine. This rock-shaft 17 is fitted with two radial arms, 18 18, which terminate in segmental racks 20 20, to gear, respectively, with pinions 21 21, secured, severally, upon the axles of the two wheels 2 and B², while a vertical rack, 22 carried by the indicator-rod D² of the second groups of keys and attached to said rod by a cross-arm, 23, is made to gear directly with a pinion fixed upon the axle of the wheel 2. The hundreds-wheels 3 and B³ also revolve each upon an independent axle and are geared together by means of a rock-shaft, 24, mounted in the front part of the frame of the machine below the wheels and parallel with the shafts 11 and 17, said shaft being fitted with three radial arms, 25, 26, and 27, each terminating in a segmental rack, 28. Two of said racks, 25 27, are made to gear, respectively, with pinions 29 and 30, severally fixed upon the axles of the wheels 3 and B³, and the third, 26, with a vertical rack, 31, carried by the indicator-rod D³, which is actuated by the third group of keys, the rack being attached to the rod by a cross-arm, 32. The thousands-wheels 4 and B⁴ likewise revolve upon independent axles, and are similarly geared to revolve in unison by means of a fourth rock-shaft, 33, mounted in the upper front portion of the frame near the top of the wheels parallel with the shaft 24, said rock-shaft being fitted with two radial arms, 34 35, to project outside of the wheels 4 and B⁴. These arms terminate in segmental racks 35 and 36, engaging, respectively, pinions 37 37, fixed severally upon the axles of said wheels, the opposite end of the axle of the wheel B⁴ being fitted with a second pinion, 38, to gear with a vertical rack, 39, carried by the indi-

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cator rod D^4, which is actuated by the fourth group of keys.

The pinions are so proportioned with reference to the length of stroke of the indicator-rods that a full movement of either rod, as produced by operating or playing the nine-key in either group, will produce a revolution of the corresponding indicator-wheels from 0 to 9.

The wheels when properly geared and adjusted will, when the indicator-rods are depressed, exhibit the cipher, and when the keys are free the rods are automatically depressed and the several indicating-wheels thereby brought to their normal position to exhibit each the cipher thereon by the weight of the rods and of the racks which they carry. This automatic drop of the indicator-rods by means of their gravity serves not only to carry the indicating-wheels to their normal position at zero, but also to elevate the outer end of the key which has been played, so as to restore it to its normal position. The figures upon the two sets of indicating-wheels are relatively so adjusted that corresponding figures on each shall appear simultaneously at the front and rear openings, through which they are respectively brought to view, and hence the reading of the figures at each opening will always be the same.

The ends of each of the four parallel rock-shafts 11, 17, 24, and 33, which are respectively actuated, in manner as described, by the movements of the several indicator-rods D^1, D^2, D^3, and D^4, are extended out at one end of the machine, and a central axle, 10, is fixed midway between them parallel therewith. Upon this axle are fitted four concentric tubular shafts, 41, 42, 43, and 44, differing in length. The innermost of these shafts, 41, is the longest. It revolves freely upon the axle 10 and carries upon its outer end a type-wheel, 45, and upon its inner end a toothed wheel or pinion, 46. The next shaft, 42, revolves freely upon the shaft 41, and also carries upon its outer end a type-wheel, 47, and upon its opposite end a toothed wheel, 48. In like manner the concentric shafts 43 and 44 revolve, respectively, each loosely upon the shaft encircled thereby, and each is fitted with a type-wheel, 49 and 50, at its outer end, and a toothed wheel, 51 and 52, at its inner end. The four type-wheels are thus brought side by side at one end and the four toothed wheels side by side at the other. All four type-wheels are of the same diameter, and the toothed wheels are likewise equal in diameter.

Each type-wheel carries upon its periphery type representing the nine digits and a cipher, or other figures to correspond with the figures on the indicating-wheels. The toothed wheels 16, 18, 51, and 52 are severally geared each with a segment, S, S', S'', or S''', carried upon an arm projecting from one of the four rock-shafts 11, 17, 24, and 33. The innermost type-wheel shaft, 41, is thus geared by its pinion 46 to the rock-shaft 11, which is actuated, in manner as described, by the indicator-rod D^1 of the first or units group of keys. The second type-wheel shaft, 42, is in a similar manner geared by its pinion 48 to the rock-shaft 17, actuated by the indicator-rod D^2. The third type-wheel shaft, 43, is in a similar manner geared to the indicator-rod D^3, and the fourth, 44, to the indicator-rod D^4. These type-wheels are so adjusted that when the indicator-rods are all in their normal or depressed position and the indicating-wheels all stand at zero the cipher-type upon the several wheels shall all be in line of print, and a movement of any one rod shall bring to line of print a type upon the type-wheel which it actuates corresponding to the number of the key played and of the figure exhibited on the indicating-wheels.

To obtain an impression from the type-wheels of such figures thereon as are brought to the line of print, a spring-actuated platen, 55, (see Fig. 9,) is mounted under the wheels upon a vertical rod, 56, adapted to play freely in suitable bearings in the frame, and which is automatically carried upward when free by an encircling spiral spring, 57. The platen is carried by the spring to within a short distance of the type, and is then left free to move up independently of the spring, so as to strike the type by momentum alone. It is actuated by means of a lever, 58, pivoted at one end to the frame, to extend beyond the platen-rod 56 and out through the casing at the end of the machine, said lever operating to depress the platen and compress its spring 57. A lateral pin, 59, upon said lever is made to engage, as the lever is carried downward, a lug, 61, (see dotted lines, Fig. 10,) upon a spring-actuated sleeve, 60, rotating upon a stud projecting from the platen-rod. (See Fig. 9.) The movement of the sleeve in a direction to allow the lug 61 to turn out of engagement with the pin on the lever is prevented by a suitable stop, its contact with the stop being enforced by a spiral spring inclosed within the sleeve, so that the lug will furnish a bearing for said pin as the pin moves downward. Hence as the lever 58 descends its pin 59 strikes the lug 61 and carries down the platen-rod 56 and platen 55 until, by reason of the sweep of the pin about the pivot of the lever it slips off of the lug, whereupon the platen will fly up, under the influence of its spring 57, to strike the type. As the lever moves up again, the play of the sleeve 60, carrying the lug 61, will allow the pin 59 on the lever to turn the lug so as to slip by it, while the action of the spring upon the sleeve will carry the lug back again into its normal position. The lever 58, after being depressed to draw down the platen, is automatically returned to its normal position by means of a spring, 62. (See Fig. 10.)

Parallel horizontal guide-plates 64 65 are fitted in the end of the frame-work of the machine (see Fig. 10) in position to guide a

strip of card-board or paper in between the platen and type-wheels in readiness to receive an imprint from said wheels, the plates being slotted to permit the platen to pass through them against the type. An inking-ribbon, 65, is led horizontally over the upper guide-plate, so as to cover the slot therein and be interposed between the type and the paper inserted between the plates 61 61, said ribbon being wound upon spools *d d*, (see Fig. 9,) carried upon spindles 66 66, mounted in the frame on each side of the plates, and which are geared to pinions *e e*, actuated by rotating knobs *f f* outside of the casing, as shown in Figs. 1, 3, and 9, to facilitate their movement by hand in feeding the ribbon back and forth under the type.

The platen 55, in moving up through the slots in the guide-plates, will carry the paper inserted between said plates *a*, *a*, past the inked face of the ribbon and force the paper and ribbon against the type, so as to cause the latter to produce their imprint upon the paper in the customary manner.

A cash receptacle box, 6, of any suitable description, is arranged in the base of the machine. The receptacle illustrated in the drawings, Fig. 1, is represented as constructed in two sections, the lower one, 6, being stationary and the upper one, 6', adapted to slide in and out upon the lower one. The opening into this cash-box is covered by a movable curved lid, H, which, being in the form of a segment of a cylinder, is mounted at each end upon quadrants I I, each of which is secured at the intersection of its straight sides to an axial rock-shaft, 69, mounted in suitable bearings in the base of the machine, so that the lid attached to said quadrants and vibrating with the rock-shaft may be thereby turned down to cover and close the opening into the cash-box, or swung up to uncover the same. The reciprocating movement of the lid is produced by the revolution of a ratchet-wheel, J, fixed to turn loosely upon a shaft, 70, mounted parallel with the axis of the lid in the base of the machine, and which is coupled to one of the quadrants by means of a connecting-rod, 71, pivoted at one end to the front arm of the quadrant and at the other to a wrist-pin, 72, projecting from the outer face of the wheel, the two being so arranged that a continuous revolution of the wheel in one direction will operate to swing the quadrants back and forth, and thereby alternately open and close the lid H, carried thereon.

The wheel J is made to revolve by the tension of a helical spring, 73, coiled around the shaft 70 between two parallel disks, L and M, one of which, L, is fixed to the shaft and the other, M, mounted to turn loosely upon it, the ends of the spring being made fast, respectively, to the two disks.

The spring 73 is wound to actuate the wheel J by the movement of the hand-lever N, actuating the rock-shaft 14, upon which the keys are pivoted, through the intervention of a segmental rack, 75, adapted to gear with a toothed wheel, 76, revolving loosely upon the shaft 70, alongside the disk M, but which is coupled thereto when turning in the direction to wind up the spring by means of a pawl, 77, pivoted to the side of the disk to engage the teeth of the wheel 76.

Normally the hand-lever N rests in a vertical position, its handle end being made to project out through the casing of the machine, as shown in Figs. 1 and 3. By swinging the handle forward and down the segmental rack is made to turn the toothed wheel 76 in a direction to wind the spring 73, and by reason of the engagement of the pawl 77 with said toothed wheel the disk M and its attached spring 73 is turned with it, so as to cause the spring to be wound up. In the meantime the wheel J is held to confine the outer end of the spring by means of a pin, 78, upon the end of an arm, 79, projecting from a rock-shaft, 80, to engage a notch, *n*, in the periphery of an annular concentric groove, *m*, cut in the face of the disk L, as shown in Fig. 12. After the spring is wound it is prevented from unwinding as the handle N makes its reverse movement by means of a pawl, 95, adapted to engage a notch in the periphery of the disk M. The disk M being thus held by the pawl 95, the reverse movement of the handle-lever to restore it to its normal upright position is permitted by the independent revolution of the toothed wheel 76 in the opposite direction produced, as the lever is thrown up.

The respective gears are so proportioned that a single downward stroke of the hand-lever N will operate to wind the spring 73 sufficiently to give it the requisite power to produce effectively one complete revolution of the wheel J. This revolution is permitted, when the spring is wound, by lifting the pin 78 out of the notch *n*; but the pin, riding in the groove *m*, will again automatically engage the notch so soon as the single revolution is completed, its engagement being enforced by means of a spring, 81, actuating the arm 79, carrying the pin.

The disengagement of the pin 78 from the notch *n* is produced automatically in the machine by the play of any one key in the entire series of keys through the intervention of a series of swinging bars, 83 83, (one for each group of keys,) each pivoted upon arms 84 84, so as to rest transversely over the rear ends of all the keys in a group in position to be engaged by fingers 85 85, projecting upwardly from each key-lever, and to be lifted by either one of said fingers when its key is played. One of the arms 84 of each of said swinging bars 83 is coupled by a connecting-rod, 86, with a radial arm, 87, projecting from the rock-shaft 80, so that the lifting of either bar 83 by the play of a key (see Figs. 3 and 4 and dotted lines in Fig. 5) will operate to oscillate the shaft 80, and thereby lift the arm 79, and with it the pin 78. The connection of the rod 86 with the arm 87 is effected by

means of a pin, *f*, projecting from the arm through a longitudinal slot in the rod, whereby a certain extent of lost motion is permitted before the arm is lifted by the key, as shown in dotted lines, Fig. 3.

The swinging lid H of the cash-box is so adjusted with reference to its actuating-wheel J and controlling-disk L that when the key-pin 78 is in engagement with the notch *n* on the disk L the lid will be wide open.

As a complete revolution of the controlling-disk L and wheel J will operate not only to close the lid, but to open it again, provision is made for arresting the wheel J so soon as it has made a half revolution, and thereby closed the lid, by cutting a second notch, *p*, in the periphery of the annular groove *m* on the face of the disk L at a point diametrically opposite the first notch, *n*, (see Fig. 12,) and providing a second pin, *q*, upon the end of an arm, 88, to engage said notch, its engagement being enforced by a spring, *i*. This arm 88 is made to project from one end of a rock-shaft, *w*, which is parallel with the shaft 70, and whose opposite end extends into line with the segmental rack 75.

The proximate end of the rack 75 is fitted with a tooth, 91, which, as the rack moves toward the arm, strikes against a pivoted lug, 92, on the end of the arm 88, and, moving it, passes by it; but as it returns and again engages the lug the lug is prevented from yielding by a stop-pin engaging an offset, 93, thereon, and the rack is consequently made to depress the arm, so as to clear the lug, and by depressing the arm causes a release of the pin *q* from the notch *p* and allows the controlling-disk L to complete its revolution, and thereby close the lid H. A reverse movement of the lid at any point is prevented by a pawl, 94, which engages a series of ratchet-teeth on the periphery of the actuating-wheel J. (See Fig. 5.)

At the moment the downward movement of the handle N is completed and the spring 73 is consequently fully wound the pawl 95, engaging the winding-disk M, prevents its reverse movement and a consequent unwinding of the spring independently of the disk L. A second spring-actuated pawl, 96, pivoted upon the pivotal stud of said pawl 95, is in the meantime held out of engagement with a notch or shoulder, *r*, on the periphery of the disk M by means of an offset or projection, 97, upon the controlling-disk L, said projection 97 being adapted to pass under a lateral offset or extension of the pawl 96, formed to overlap the periphery of said disk, but so soon as, upon the completion of the return or up stroke of the handle N, the disk L is allowed, as hereinbefore described, to make a half-revolution, the pawl 96 will drop into engagement with the shoulder *r* upon the disk M, and thereby operate to prevent a forward movement of said disk. By this means a complete lock of the disk M and handle N and of all mechanism actuated thereby is produced until a key is depressed and the disk L permitted to complete its revolution and close the lid H, whereupon the completion of the revolution of the disk L, by bringing the offset 97 again under the pawl 96, will release it.

The action of the hand-lever N upon the rock-shaft 11 to produce its oscillation is preferably cushioned, as shown in Fig. 3, by pivoting the lever loosely upon the shaft, and then coupling the two together by means of a rod, 98, pivoted to an offset on the lever, to work through an aperture in a corresponding offset, 99, projecting from the arm N′ of the segmental rack 75, fixed to said shaft, the rod being encircled by a spring, 100, interposed between said offsets, and prevented from drawing out of the offset 99 by means of a transverse pin, 101.

To prevent a reversal of the hand-lever N in either direction at any point intermediate the extreme limits of its movement, two segmental ratchets, 102 and 103, (see Figs. 3 and 5,) are fixed to the frame of the machine close alongside and parallel with the arm N′ of the segmental rack 75, and a double-ended pawl, 104, is pivoted to said arm in position to move over said ratchets and to engage the teeth of the one when moving in the one direction and of the other when moving in the opposite direction. This double pawl 104 is tripped at the end of the stroke of the lever, so as to change its engagement from the one ratchet to the other, by striking against suitable stops, 105 105, fixed to the frame, and so soon as tripped it is supported and kept in engagement with the ratchet by means of a spring-actuated latch, 106, pivoted to the arm N′, and which terminates in an angular tip adapted to engage the opposite faces of a V-shaped offset on the pawl, as shown in dotted lines in Fig. 3.

An automatic return of the hand-lever N to its normal position after it has been depressed is produced by means of a spring, 107, adapted to be brought into action by the first movement of the lever.

In the use of the machine the hand-lever N is normally in an upright position, as shown in Figs. 1 and 3, the lid H of the cash-box is closed and locked, and the keys last played are locked. The cash-box cannot now be opened until a complete stroke down and back has been made of the handle. This movement may be utilized to operate an adding mechanism of approved construction by which the amount indicated by the keys last played is added to the sum of the amount previously indicated; but the devices for producing this result form no part of the present invention, and need not therefore be herein described or illustrated. The down-stroke of the hand-lever N will operate to release the keys, turn the indicating-wheels to the zero sign, wind up the spring by which the drawer is operated, and also set the spring by whose resiliency an upstroke of the lever is pro-

duced so soon as the power or pressure thereon is removed. Once the downstroke of the lever has commenced it must be fully completed before the lever can be returned to its normal position, by reason of the engagement of the pawl 104 with the rack 102; but so soon as the end of its stroke is reached the pawl 104 is tripped or reversed by contact with the fixed stop 103, so that it is relieved from the rack 102 and thrown into contact with the opposite rack, 103. At the completion of the return or up stroke of the hand-lever (which is preferably enforced automatically by the spring 107) the lid H of the cash-box is thrown open by the release of the spring which actuates it, and the lever itself becomes locked in its upright position, so that it cannot again be moved until a key is played.

By playing a key the appropriate indicating-wheels are turned to bring to view on both sides of the machine a number corresponding with that of the key played, a type bearing the same number is brought into line of print, the hand-lever is unlocked, and the lid of the cash-box automatically closed and locked.

It is evident that instead of coupling the outer end of the connecting-rod 71 to a movable lid adapted to be carried back and forth over a fixed cash-receptacle it may be coupled to a movable cash-receptacle adapted to be carried back and forth under a fixed lid, and that, without departing from my invention, the actuating-wheel, driven and controlled in manner as described, may be made either to move a cover over a cash box or to move a cash-box under a cover by coupling the reciprocating connecting-rod carried by the wheel either to the one or to the other. It is also evident that without departing from my invention the lid or cover of the cash-box may be made to slide in a horizontal plane back and forth over the box, instead of swinging back and forth over it, in manner as described.

I do not herein claim the combination, with a group of keys, of a locking-strip adapted to engage each key so soon as it is played and to be released by the movement of the oscillating hand-lever, said invention being the subject-matter of a claim made by C. E. Hadley and myself, as joint inventors, in a separate application for Letters Patent, Serial No. 268,432, now pending. Nor do I claim, broadly, duplicate indicating-wheels geared to move in unison and display simultaneously the same numbers at front and rear of the machine, my invention consisting in the novel combination and arrangement of a duplicate series at front and rear of the machine, each comprising two or more wheels geared and arranged to be simultaneously operated, so that the several numbers in both series shall simultaneously read correctly in the same order from left to right.

I claim as my invention—

1. The combination, in a cash-indicating machine, of a group of keys all having the same length of stroke, a single reciprocating rod moved differentially by the engagement therewith of each separate key at a different interval in the length of its stroke, and a series of signal characters or numbers designating severally the several keys, all actuated by the movements of the one rod and each brought to view by a different length of movement of said rod, substantially in the manner and for the purpose herein set forth.

2. The combination, in a cash-indicating machine, of a group of oscillating keys pivoted intermediate their ends upon a common shaft, a vertically-reciprocating rod mounted at the rear of said keys to be actuated thereby, a plate fixed to the vertical rod, with its lower edge extending transversely over the ends of said keys and having differential notches or offsets formed in said edge, each adapted to be engaged by one of said keys, (whereby each key in making its stroke will produce a different extent of movement of the rod,) and one or more wheels geared to said rod, to be revolved thereby, and which bear characters or numbers designating the several keys in the group, substantially in the manner and for the purpose herein set forth.

3. The combination, in a cash-indicating machine, of two or more groups of keys, a series of two or more indicating-wheels, each bearing numbers or characters corresponding with the keys in one of said groups, and which are mounted to be read in their normal order from left to right at the front of the machine, and a second series of duplicate wheels mounted to be read in similar order from left to right at the rear of the machine, the corresponding wheels in the two series being geared to move in unison and be actuated simultaneously by the movement of the one key appropriate thereto, substantially in the manner and for the purpose herein set forth.

4. The combination, in a cash-indicating machine, of a series of indicating-wheels, each revolving about a common axis, a corresponding series of concentric tubular shafts revolving upon the same axis, a type-wheel upon each shaft, a series of rock-shafts mounted parallel with the axis of the indicating-wheels, and suitable gear coupling each rock-shaft with an indicating-wheel at one end and with one of said tubular shafts at the other, substantially in the manner and for the purpose herein set forth.

5. The combination, in a cash-indicating machine, of one or more type-wheels, keys C, to operate said wheels, two superimposed, slotted, or perforated guide-plates mounted adjacent thereto and below the same, a platen moving through the opening in the plates into contact with the type-wheels, a spring operating to carry the platen toward the type, a stop to limit the action of the spring before the movement of the platen is completed, a pivotal lever adapted to withdraw the platen and contract the spring, and a yielding contact-point adapted to engage the lever as it moves in the direction to withdraw the platen

and allow its independent return, substantially in the manner and for the purpose herein set forth.

6. The combination, in a cash-machine, of a movable lid, a pivoted segmental frame, to which said lid is secured, an actuating-wheel revolving upon an axis parallel with the pivotal axis of the lid, a wrist-pin upon the wheel, and a connecting-rod coupling the wrist-pin with the pivoted frame, whereby the revolution of the wheel is made to alternately open and close the lid, substantially in the manner and for the purpose herein set forth.

7. The combination, in a cash-machine, of a movable lid, an actuating-wheel revolving on an axis at a right angle to the line of movement of said lid, a wrist-pin upon the wheel, a connecting-rod coupling the wrist-pin and lid, a coiled spring actuating the wheel to produce an automatic revolution thereof, a controlling-disk secured to the axle of the wheel, to revolve with it, a movable stop-pin adapted to engage a notch or offset on said controlling-disk to arrest the movement of the wheel at each complete revolution thereof, a group of pivoted actuating-keys, a transverse bar pivoted above the ends of the keys, to be struck and lifted by either of them when the key is played, a rock-shaft mounted parallel with the axis of the actuating-wheel beneath the key-bar, a connecting-rod coupling said bar with a radial arm on the rock-shaft, and a radial arm projecting from the rock-shaft, to carry the stop-pin, whereby the play of a key will operate to disengage the stop-pin and allow the wheel to make its revolution, and thereby automatically open and close the lid, substantially in the manner and for the purpose herein set forth.

8. The combination, in a cash-machine, of a movable lid, an actuating-wheel revolving on an axis at a right angle to the line of movement of said lid, a wrist-pin upon the wheel, a coupling-rod connecting the wrist-pin and lid, a spring actuating the wheel to produce an automatic revolution thereof, a controlling-disk secured to the axle of the wheel, to revolve with it, a movable stop-pin adapted to engage a notch or offset on said controlling-disk, to arrest the movement of the wheel at each complete revolution thereof, a second movable stop-pin adapted to engage a second notch or offset formed at a diametrically-opposite point on the disk, to arrest the movement of the wheel at each half-revolution thereof after it is disengaged from the first stop-pin, a pivotal arm carrying said second stop-pin, a spring enforcing the engagement of the pin with the notch or offset, and an oscillating hand-lever adapted to move the arm and disengage the pin, substantially in the manner and for the purpose herein set forth.

9. The combination, substantially as set forth, of the actuating-wheel coupled, as herein described, to the reciprocating lid of a cash-machine, a controlling-disk secured to the axle of said wheel, to revolve with it, a movable stop-pin adapted to engage a stop or offset on said disk, to arrest its movement at a complete revolution thereof, a second movable stop-pin adapted to engage a second notch or offset on said disk, to arrest its movement at a half-revolution thereof after it has been disengaged from the first stop-pin, a pivoted arm carrying said second stop-pin, a spring enforcing the engagement of the pin with the notch or offset, a second winding-disk mounted parallel with the controlling-disk, to revolve independently about the same axis, a helical spring coiled between the two disks and secured at either end thereto, a pawl pivoted outside the winding-disk, to engage a notch in its periphery and prevent a reverse movement of the disk after the spring is wound, a toothed wheel revolving loosely upon the hub or axle of the winding-disk, a pawl pivoted to said disk, to engage the toothed wheel and prevent its independent rotation as the spring is wound, an oscillating hand-lever, a segmental rack carried by said lever and which gears with said toothed wheel, a spring-actuated yielding stop fitted upon the arm which carries the second stop-pin, to engage the controlling-disk, and a tooth upon the segmental rack adapted to slip by the yielding stop as the rack moves forward, to wind up the spring and to engage the stop and move the lever so as to release the controlling-disk at the end of the return-stroke of the rack, substantially in the manner and for the purpose herein set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM KOCH.

Witnesses:
A. N. JESHERA,
E. M. WATSON.

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(No Model.) 2 Sheets—Sheet 1.

L. L. WANDS.

PRICE INDICATING ATTACHMENT FOR WEIGHING SCALES.

No. 410,389. Patented Sept. 3, 1889.

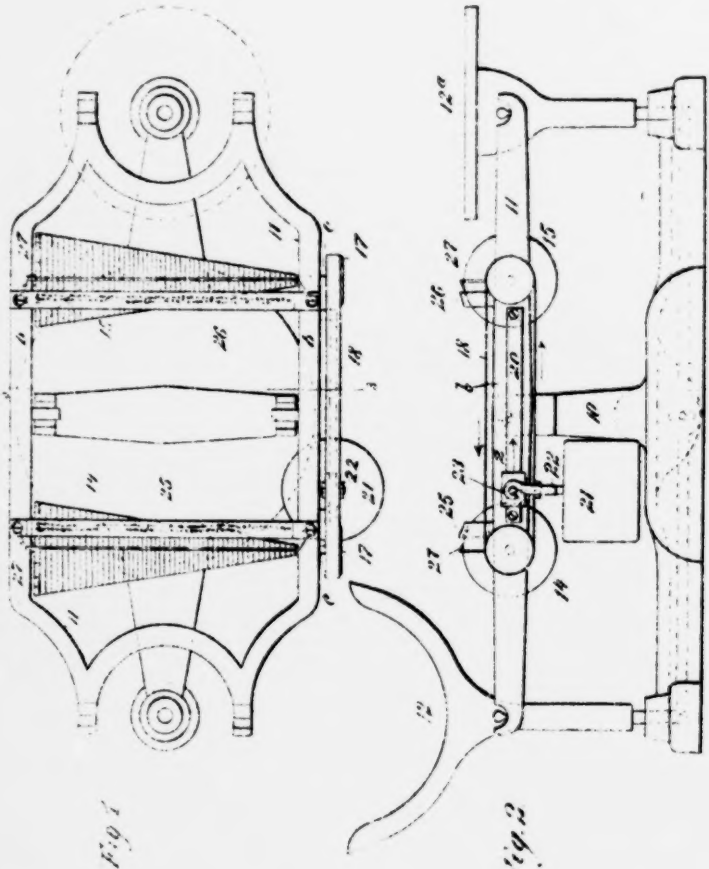

Fig. 1.

Fig. 2.

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L. L. Wands
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(No Model.) 765 2 Sheets—Sheet 2

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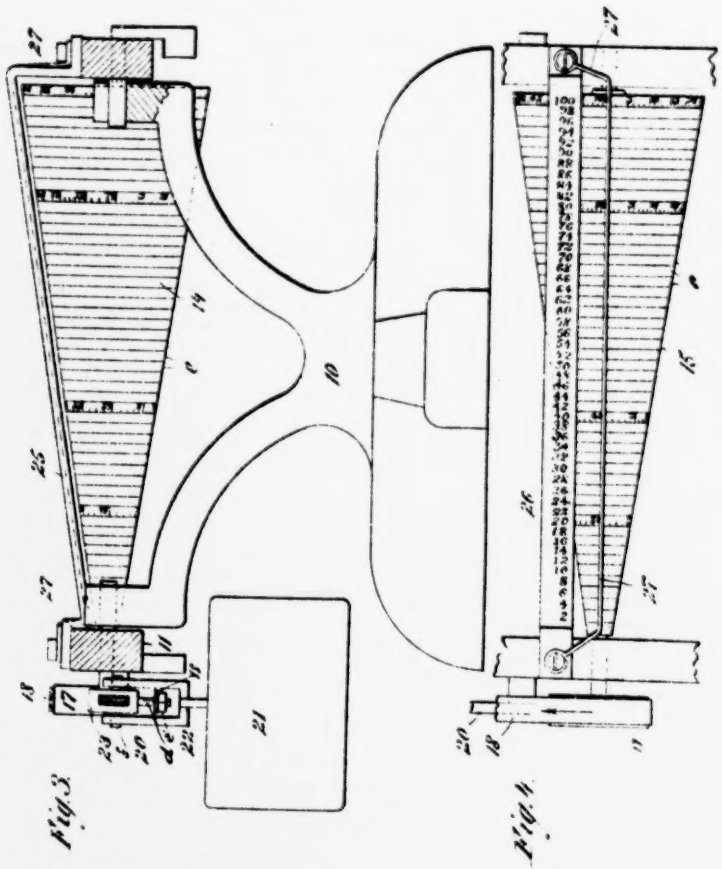

Fig. 3.

Fig. 4.

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UNITED STATES PATENT OFFICE.

LUCIUS L. WANDS, OF WEST SHOKAN, ASSIGNOR TO HEWITT BOICE, OF KINGSTON, NEW YORK.

PRICE-INDICATING ATTACHMENT FOR WEIGHING-SCALES.

SPECIFICATION forming part of Letters Patent No. 410,389, dated September 3, 1889.

Application filed November 23, 1888. Serial No. 291,668. (No model.)

To all whom it may concern:

Be it known that I, LUCIUS L. WANDS, of West Shokan, in the county of Ulster and State of New York, have invented a new and Improved Price-Indicating Attachment for Scales, of which the following is a full, clear, and exact description.

The object of this invention is to provide an attachment for scales whereby the value of any fraction of a given unit of weight at any price per unit from 1 to 100 will be indicated; and to this end the invention consists of two indicators, preferably cone-shaped, that are divided into sections by lines that run at right angles to the axes of the cones, each section being in turn divided by lines that are substantially parallel with the axis of the cone, strips arranged in connection with the cones, the strips being divided into sections corresponding in width to the cone-sections, said sections being numbered from 2 upward upon one strip, all the even numbers appearing on said strip, while the sections of the other strip are numbered from 1 upward, all of the odd numbers appearing on this strip. To facilitate the reading of the cones, I provide wires which run in close proximity to the surfaces of the cones and directly above and parallel with the axes of the cones, and in connection with the cones I provide a mechanism whereby the cones are each rotated by the movement of a balancing-weight, the movements of the cones being in proportion to the distance traversed by the weight upon its supporting-beam.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of a portion of a counter-scale, representing the same as it appears when provided with my price-indicating attachment. Fig. 2 is a side view of the scale. Fig. 3 is a cross-sectional view on line 3 3 of Fig. 1. Fig. 4 is a plan view of the cone arranged in connection with the bar or strip upon which the even numbers appear, views 3 and 4 being on an enlarged scale.

In the drawings, 10 represents the standard, 11 the beam, 12 the scale-pan, and 12* the plate or weight-support of an ordinary counter-scale.

In applying my attachment I journal cylinders or cones 14 and 15 between the longitudinal sections *b* of the beam 11, the journals extending through the forward section b_* as shown at *c*, and to these extending journal ends I secure pulleys 17, Figs. 1 and 4, which carry a metallic belt 18. Between the parallel lengths of the belt 18, I attach an auxiliary beam 20, said auxiliary beam being carried by the forward section *b*, Fig. 2, of the main beam 11. Upon the beam 20, I mount a slide 23, (shown best in Figs. 2 and 3,) having a threaded shank *d*, which passes downward through an aperture formed in the lower length of the belt 18, the lower end of the shank being engaged by a nut *e'*, by means of which the tension of the belt may be regulated, the nut being turned upward when it is desired to tighten the belt. From the slide 23, I suspend a weight 21 by means of a double hook 22, which engages projections *f'*, Fig. 3, that extend outward from the sides of the slide.

The cone 14 is divided transversely into fifty sections *e*, and these sections are divided circumferentially as follows: The sections nearest the base of the cone or the far side of the cylinder are divided into ninety-nine subdivisions, which said subdivisions are divided into periods of five, numbered from zero up to 95, the last period being divided into four spaces. The eleventh section from the base of the cone or the back of the cylinder is divided into seventy-nine subdivisions, the periods being numbered from zero up to 75, and the last period being divided into four spaces to complete the seventy-nine subdivisions of this particular cone-section, and this plan is followed in dividing each cone-section, a corresponding plan being followed in the division of the cone 15. Each of the spaces, supposing the unit of value to be one dollar, will represent one cent. In fact, each of these sections must be divided into as many parts circumferentially as there are units in its denominating number, the divisions being preferably made by dots and elongated marks, as shown in the drawings, the numbering of all spaces starting upon a line that is exactly

parallel with the axis of the cylinder or cone, as will be readily understood.

Above the cone 14 there is mounted a strip, 25, that is divided into fifty spaces, numbered from 1 to 99, while above the cone 15 there is mounted a strip 26, divided into fifty spaces, that are numbered from 2 to 100, the spaces of the strips registering with the spaces of the cones. These strips are secured to the beam in any proper manner, but preferably by screws, as shown best at *c* in Fig. 3, the strips being bent so as to rest closely above the cylinder or cone faces.

To facilitate the reading of the cones, I arrange wires 27, which run in close proximity to the cone-surfaces, exactly above and parallel with the axes of the cones, one of these wires being employed for each cone, and when the scale is at rest and the beam balanced the zero-line upon each cone or cylinder will be just to one side of these wires. Let it be supposed that the scale in connection with which my attachment is arranged is designed to weigh pounds and that the unit of value is one dollar; then in adjusting the attachment the beam 20 and the weight 21 should be so proportioned that if the weight be moved to the position in which it is shown in Fig. 2 to the opposite end of its beam it would counterbalance one pound placed in the pan 12.

Suppose it is desired by means of my attachment to ascertain the value of a quantity of merchandise worth forty cents a pound. The merchandise is placed in the scale-pan 12, and pound counterbalancing-weights are placed upon the scale-plate or weight-support 12ª until it is ascertained that the merchandise weighs, we will say, between five and six pounds. Then, after this approximate weight is ascertained, the weight 21 is moved along the beam 20 in the direction of the arrow shown in Fig. 2, and in so moving it will carry the belt 18 in the direction of its arrow, and as the belt moves, as indicated, the cones or cylinders 14 and 15 will be rotated, a full rotation of the cones being brought about by moving the slide 23 from one end of its beam to the other, as has been hereinbefore explained; but as the slide 23 is moved, as just described, it will be brought to a point at which the weight 21, in connection with the weights on the scale-pan or weight-support 12, will exactly counterbalance the merchandise in the scale-pan 12. Then, if we glance at the cone 15 and read the number lying with the wire 27 that appears opposite the division numbered 40 on the strip 26, we will find the value of the fractional portion of a pound of the material contained in the scale-pan 12. Let us suppose that this fractional part is one-half of a pound. In that case the slide 23, and with it the weight 21, would have moved one-half of the distance toward the right-hand end of its beam, and consequently a one-half turn would have been imparted to the cone, thus bringing the mark 20 beneath the wire 27; and supposing that there were five pound counterbalancing-weights placed in the scale-plate 12ª we would know that the value of the goods would be two dollars and twenty cents.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a price-indicating attachment, the combination, with a revoluble indicator divided longitudinally into a number of sections, said sections being proportionately divided, of a strip divided into numbered sections, a counterbalancing-weight, and connections, substantially as described, between the indicator, and weight, whereby when the weight is moved the indicator will be turned, as and for the purpose stated.

2. The combination, with indicators divided substantially as described, of numbered strips arranged in connection with said indicators, pulleys carried by the indicator-journals, a belt carried by the pulleys, a weight, and a beam, the weight being connected to one length of the belt, substantially as described.

3. In a price-indicating attachment, the combination, with indicators divided longitudinally into sections, the sections of one indicator being divided proportionately from 1 to 99 and the sections of the other indicator being divided proportionately from 2 to 100, strips divided into sections which correspond with the indicator-sections, the sections of one of the strips being numbered from 1 to 99 and the sections of the other strip from 2 to 100, pulleys carried by the indicator-journals, a belt carried by the pulleys, and a weight connected to the belt and suspended from a beam, substantially as described.

4. In a price-indicating attachment, the combination, with indicators 14 and 15, of strips 25 and 26, wires 27, pulleys 17, carried by the indicator-journals, a belt 18, arranged in connection with the pulleys, a beam 20, a weight suspended from said beam, and connections between one length of the belt and the weight, substantially as described.

CHARLES L. WANDS.

Witnesses:
GEO. SIMON,
CHARLES C. BOND.

1239

(No Model.)

C. M BABCOCK.

769

COMPUTING SPRING SCALES.

No. 421,805. Patented Feb. 18, 1890.

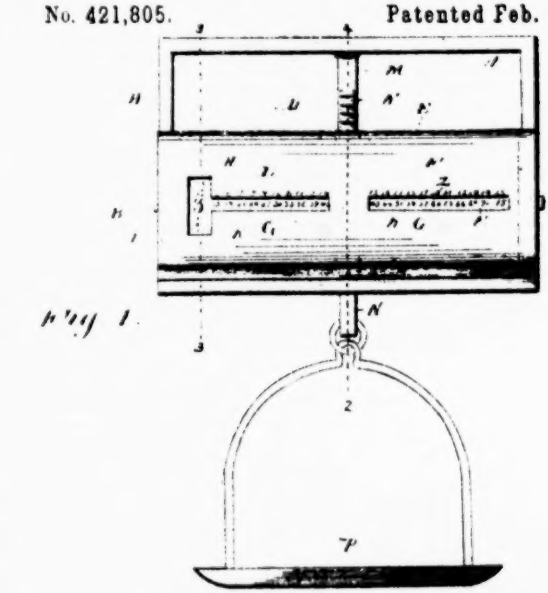

Fig. 1.

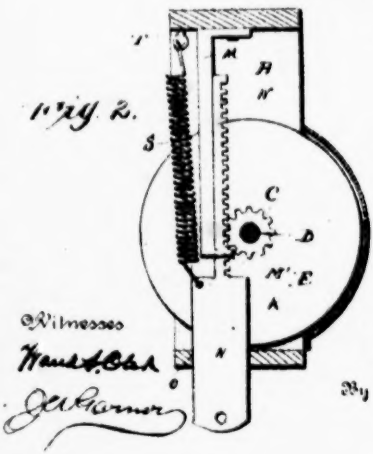

Fig. 2.

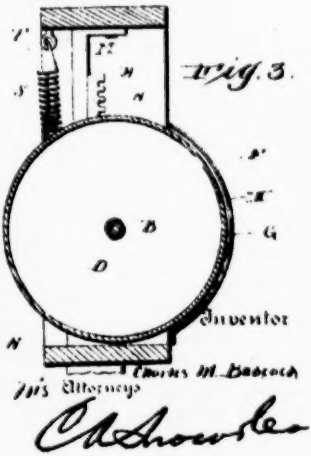

Fig. 3.

Witnesses

Inventor

Charles M. Babcock

By his Attorneys

UNITED STATES PATENT OFFICE.

CHARLES MONTGOMERY BABCOCK, OF GARRATTSVILLE, NEW YORK.

COMPUTING SPRING-SCALES.

SPECIFICATION forming part of Letters Patent No. 421,805, dated February 18, 1890.

Application filed [illegible], 1889. Serial No. [illegible]. (No model.)

To all whom it may concern:

Be it known that I, CHARLES MONTGOMERY BABCOCK, a citizen of the United States, residing at Garrattsville, in the county of Otsego and State of New York, have invented a new and useful Improvement in Computing-Scales, of which the following is a specification.

My invention relates to an improvement in computing-scales; and it consists in the peculiar construction and combination of devices that will be more fully set forth hereinafter, and particularly pointed out in the claims.

The object of my invention is to provide weighing-scales adapted to indicate instantaneously the precise value of a commodity weighed thereon at any given price.

In the drawings, Figure 1 is a front elevation of scales embodying my improvement. Fig. 2 is a sectional view of the same, taken on the line 2 2 of Fig. 1. Fig. 3 is a similar view taken on the line 3 3 of Fig. 1.

A represents a rectangular frame of suitable size and construction, in the ends of which is journaled a shaft B. Keyed or otherwise firmly secured to the center of the said shaft is a pinion C, and on the end portions of the shaft are secured cylindrical drums D E. On one side of the frame is secured a semi-cylindrical case F, which partly covers one side of the cylindrical drums. The said case is provided with transverse horizontal openings or slots G, through which portions of the drums are disclosed, and communicating with one end of the said opening G is a vertical opening H. Extending around the periphery of the drum D at one end of the same is a scale I, indicating pounds and fractional parts thereof, and inscribed on the periphery of the drums D E and arranged in longitudinal lines which align with the figures of the scale I, are scales K, which are arranged in vertical columns that align with the scale of figures I, which are arranged in a horizontal line along the upper side of the slots G and indicate the prices per pound of commodities.

M represents a stationary vertical guide-rod which depends from the upper side of the frame A, the lower end of said guide-rod extending between the cylindrical drums and being bent forward at M' and provided with a vertical slot.

N represents a rack-bar which extends through an opening O in the lower side of the frame and passes upwardly loosely through the opening just mentioned, its rear face sliding freely in contact with the front face of the guide M, and to one end of this rack-bar is attached a scale-pan P. The rack-bar engages the pinion C, and is provided on its rear side with a shoulder R, which is adapted to abut against the lower end M' of the guide-rod M, and thereby limit the upward movement of the rack-bar. The latter reciprocates between the front side of the guide-rod and the teeth at the rear of the pinion.

S represents the coiled retractile spring, which has its lower end attached to the shoulder R of the rack-bar, and has its upper end attached to an eye or keeper T at the upper side of the frame. This spring stands just in rear of the guide-rod M, between the inner ends of the drums D E, and normally retains the rack-bar at the upper limit of its movement with the naught or zero point of the scale I on the drums registering in the slot H in alignment with the open end of the slot G. When a piece of meat or other commodity is placed in the scale-pan, its weight causes the rack-bar to descend against the tension of the spring, and thereby causes the pinion to partly rotate the drums and cause the scale I to indicate the exact weight of the commodity in pounds and ounces, as will be readily understood.

The price of the commodity per pound being known and the weight thereof being indicated by the scale I, it is only necessary to consult the figure of the scale K, which there stands under the appropriate figure of the scale I, to ascertain at a glance the value of the commodity, hence rendering it unnecessary to calculate the same. For instance, if a piece of meat placed on the scale-pan weighs three pounds, the cylindrical drums will come to rest and the figure "3" of the scale I is in the opening H, opposite the end of the opening G; and, assuming that the meat is worth eight cents per pound, its value (twenty-four cents) will be indicated by the figures "24" of the scale K being directly under the figure "8" of scale I.

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Having thus described my invention, I claim—

1. The rectangular frame A, having the opening O in its base, the flat vertical guide-rod M, rigidly secured to the top of said frame and having its lower end M′ bent forward and slotted, the rack-bar N, its body passing loosely through said opening O, its toothed portion through said slotted end M′, with the rear face thereof sliding upon said flat guide-rod M, and the shoulder R between said body and toothed portion normally resting against said lower end M′, the coiled spring S, standing in rear of said guide-rod and connected at its ends to the top of the frame and to the shoulder R, and the pan P, carried by said rack-bar N, in combination with indicating devices, as D E, mounted on a shaft, and a pinion thereon engaging said rack-bar, as and for the purpose set forth.

2. The rectangular frame A, having the opening O in its base, the flat vertical guide-rod M, rigidly secured to the top of said frame and having its lower end M′ bent forward and slotted, the rack-bar N, its body passing loosely through said opening O, its toothed portion through said slotted end M′, with the rear face thereof sliding upon said flat guide-rod M, and the shoulder R between said body and the toothed portion resting normally against said lower end M′, the coiled spring S, standing in rear of said guide-rod and connected at its ends to the top of the frame and to the shoulder R, and the pan P, carried by said rack-bar N, in combination with the shaft B, journaled in said frame and passing in front of said stationary guide-rod, drums D E, mounted on said shaft on either side of said rod, rack-bar, and spring, pinion C on said shaft, engaging the toothed side of said bar and pressing it against said guide, scales marked on said drums, and a casing F on the frame covering said drums and having openings, as and for the purpose set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

CHARLES MONTGOMERY BABCOCK.

Witnesses:
H. S. MATHER,
E. C. MILLER

1242

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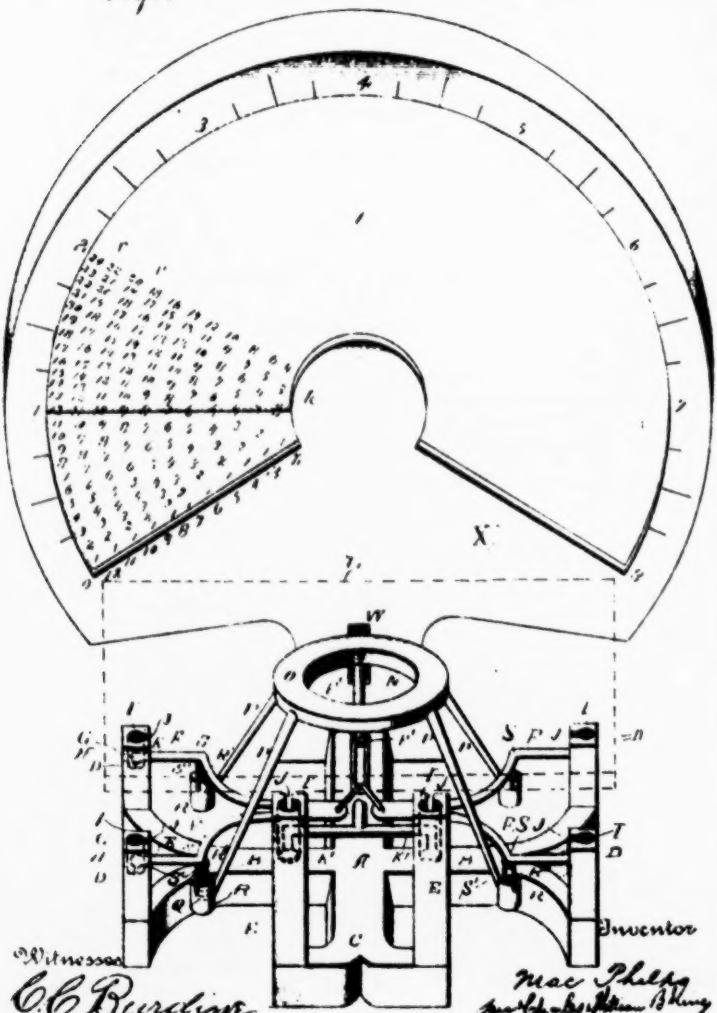
(No Model.) 3 Sheets—Sheet 1.

M. PHELPS.

COMBINED PLATFORM SCALE AND CALCULATOR.

No. 438,753. Patented Oct. 21, 1890.

Fig. 1



Witnesses
C. C. Burdine
R. H. Dorr

Inventor
Mac Phelps
per Church & Church Attorneys
His Attorneys

1243

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(No Model.) 3 Sheets—Sheet 2.

M. PHELPS.

COMBINED PLATFORM SCALE AND CALCULATOR.

No. 438,753. Patented Oct. 21, 1890.

Fig 2

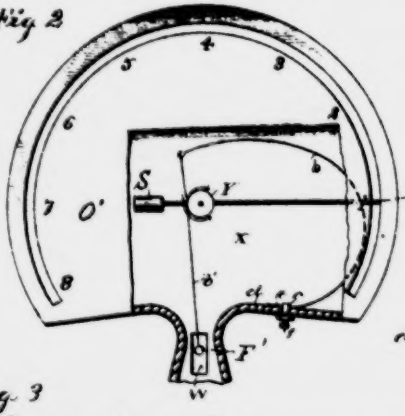


Fig 4

Fig 3

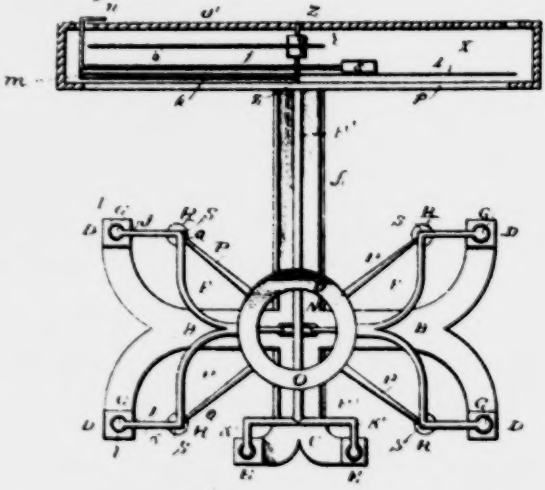
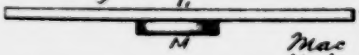


Fig 5.



Witnesses:
C. C. Burdett
R. G. Dorsey

Inventor:
Mac Phelps
per Charles William Bling
his Attorneys

1244

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(No Model.) 3 Sheets—Sheet 3.

M. PHELPS.

COMBINED PLATFORM SCALE AND CALCULATOR.

No. 438,753. Patented Oct. 21, 1890.

Fig 6

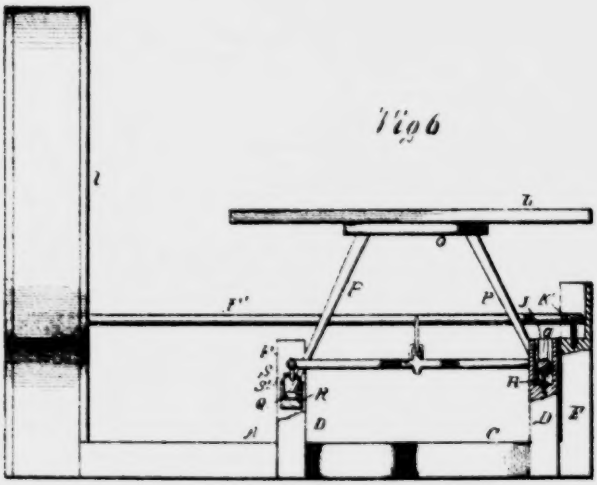


Fig 7

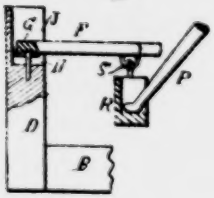
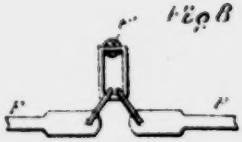


Fig 8



Witness
C. C. Burdine
R. S. Dorsey

Inventor
Mac Phelps
Charles Wm. P. King
Attorneys

1245

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UNITED STATES PATENT OFFICE.

MAC PHELPS, OF RED OAK, IOWA.

COMBINED PLATFORM-SCALE AND CALCULATOR.

SPECIFICATION forming part of Letters Patent No. 438,753, dated October 21, 1890.

Application filed April 17, 1890. Serial No. 348,303. (No model.)

To all whom it may concern:

Be it known that I, MAC PHELPS, a citizen of the United States of America, residing at Red Oak, in the county of Montgomery and State of Iowa, have invented certain new and useful Improvements in a Combined Platform-Scale and Calculator, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has special reference to an automatic platform-scale and calculator combined.

The object of my device is to produce a combined platform-scale and calculator which will automatically denote the weight and price without adjustment before or after each operation, and which will expose to view the exact weight upon one side of the dial adapted to be seen by the customer and give the price upon the opposite side, which faces the seller.

A still further object of my invention is to provide a simple, cheap, and durable article for merchants' use.

With these ends in view my invention consists in the peculiar features and combinations of parts more fully described hereinafter, and pointed out in the claims.

In the accompanying drawings, Figure 1 represents a perspective view of my complete invention as seen by the seller. Fig. 2 a front view as seen by the buyer, the exterior casing being removed to show the internal mechanism which actuates the price and weight indicator; Fig. 3, a plan, partly in section; Fig. 4, a detail view of the spring-regulator; Fig. 5, a view of the platform detached; Fig. 6, a side elevation with the posts D and E partly broken away; Fig. 7, an enlarged detail view illustrating the mode of pivoting the compound levers and supporting the platform of the scales, and Fig. 8 a detail view representing the link-connections between the levers.

The reference-letter A represents a base provided with branching arms B and C, having upon their outer extremities posts D and E, which support a system of compound levers F F'. These levers have upon their outer ends concave caps G, which fit over and are poised upon pins H, located within recesses I, having open slots J, through which the arms K K extend.

The platform L is provided with a plug M Fig. 5, upon its under side, which fits within a corresponding hole N in the top of a seat O, and this seat is provided with four legs P, having laterally-extending feet Q, which are supported within hangers R. These hangers have openings R' in them to receive the feet Q, like the openings or recesses I in the posts D, and they are suspended from the shoulders S by the bails S', so that the weight of the platform will rest upon the levers F and F'. This lever F' comprises a long rod extending parallel with the body of the frame A, and its free end passes through an elongated opening W, leading into the interior of the casing X, where it is supported by a flexible connection *b'*. This connection passes over a spindle Y, extending transversely across the interior of the casing, and is mounted in bearings Z, so that when downward pressure is brought to bear upon the platform the spindle will be rotated. A retracting spring *b* is provided with a flexible connection *b'*, which extends around the drum *y* in an opposite direction, so that the indicator will be restored to the zero-point when weight is removed from the platform. This spring is adjustably secured to the bottom wall *d* of the casing by an adjusting device, which consists of a square bolt *c*, located within a corresponding opening in the wall *d*, as seen in Fig. 4. The spring *b* passes transversely through a recess *e* in the top of the bolt, and its under side is drawn down tightly against the interior surface of the casing by means of a thumb-screw, which passes freely through a metal plate *f* upon the exterior of the casing and into a threaded aperture *g* in the bolt. The screw has a shoulder *h*, which bears against the plate in the tightening operation, but does not engage the interior of the aperture in the plate through which the bolt passes. By turning the screw to the left the bolt *c* is pushed upward and the spring *a* released, so that it can be moved endwise to stiffen or ease it in adjusting the scales.

An indicator is secured to and turns with the spindle Y, and it consists of two metal rods *j* and *k*, which pass upon opposite sides

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of a dial-plate *l*. These rods are connected at their outer free ends by a cross-rod *m*, which is provided with a pointer *n*, arranged to move across the face of the weight-dial *o'* upon the front of the dial-plate. The rod *j* is provided with a counter-balance *s*. The weight-dial is exposed to view by an arc-shaped window *p*, so that the buyer can readily see the weight of the goods purchased.

In the present instance the weight-dial is numbered from 1 to 8, with fractions of pounds.

The opposite side of the plate *l* is provided with a price-dial, before which the indicating-rod K oscillates. This dial consists of a number of concentric lines *r*, surrounding the axis or spindle of the pointer and forming a computing-table for the seller.

At the left-hand end of the lines *r*, I provide a row of figures running from 2 to 12, which represent the price per pound from two to twelve cents, increasing as they are distant from the center of the dial. The concentric lines are each provided with figures representing cents, and commencing at the price-column they increase in the ratio of those on the weight-dial. Thus in the outside line, or that one indicating meat bringing twelve cents per pound, the figures run from 1 to 12, between the zero-mark and the one-pound mark, and from 12 to 24 between the one and two pound marks, and in like ratio from the numbers indicating lower-priced meats. Around the outer line of the dial a series of numbers representing pounds are placed, so that the seller can see the weight and price at the same glance.

In using my device the merchant places the articles to be sold upon the platform L, which is supported by the hangers R, suspended from the levers F, and these levers having their free ends attached to the long lever F', depress the latter, thereby drawing down upon the cord or flexible connection *b'* and rotating the spindle against the tension of the spring B. This action moves the indicating-rod *k* over the face of the price-dial O, and the pointer *n* over the scale denoting the weight. If the price is two cents per pound, then follow up the two-cent line to the indicator *k*, and the amount will be given.

In Fig. 1 the indicator-rod *k* is shown pointing to one pound and crossing all the concentric rows of figures, so that if the price is twelve cents per pound the rod will stand before a point located just two units past number 10 in the twelve-cent row. Hence it will be seen that the hand *k* crosses transversely all the concentric rows of figures, and that the cost of any number of pounds within the weighing capacity of the scale, and within the set of prices in the transverse column at the left end of the rows, can be readily ascertained.

It is evident that my invention could be varied in many ways which might suggest themselves to a skillful mechanic. Therefore I do not limit myself to the exact construction herein shown, but consider myself entitled to all such variations as come within the scope of my device.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with a platform-scale, a plate provided with a dial upon one side representing prices, a dial upon the opposite side representing weights, a casing surrounding said plate and having openings in opposite sides to show the dial, a pointer upon one side, and an indicating-rod upon the other, whereby the weight can be told from one side and the price from the other, in the manner and for the purpose substantially as described.

2. The combination of a base provided with posts rising therefrom and having recesses in their upper ends, levers pivoted within said recesses, said levers having their free ends connected with a laterally-extending lever having its free end connected with the indicating mechanism, and a platform provided with feet resting within hangers suspended from said levers, in the manner and for the purpose substantially as described.

3. In weighing-scales, the combination of a base provided with suitable standards rising therefrom, a system of compound levers, and a platform provided with feet or suitable supports resting upon swinging hangers suspended from said levers, in the manner and for the purpose substantially as described.

4. In combination with a device for supporting the matter to be weighed, a stationary dial provided with concentric rows of figures, a pointer having its spindle coincident with that of said dial, a counterpoise upon said pointer, and a retracting-spring having one end adjustably fastened to a rigid support and the other end to a flexible connection, winding over the pointer-spindle and passing thence to the weight-supporting device, in the manner and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

MAC PHELPS.

Witnesses:
T. J. RAY,
A. R. ELLETT.

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3 Sheets—Sheet 1.

M. N. LOVELL.

CASH REGISTER AND INDICATOR.

No. 445,059. Patented Feb. 3, 1891.

Fig. 1

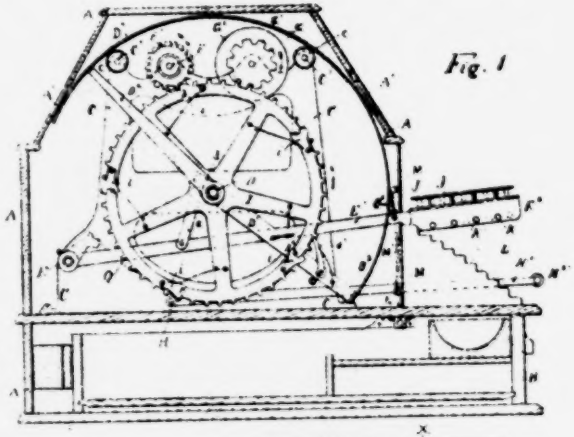
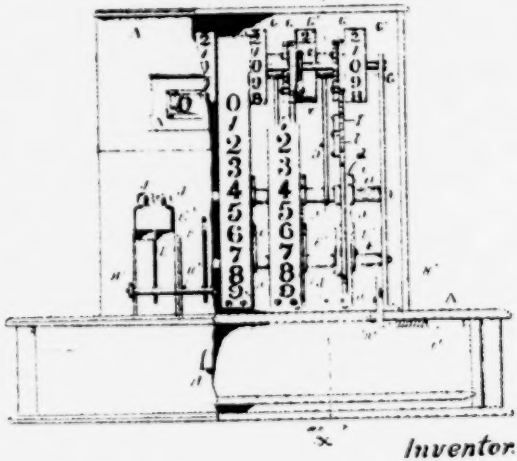


Fig. 2.



Witnesses.

Inventor.

Melvin N. Lovell

by his Attys

Fuller & Wallace

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(No Model.) 3 Sheets—Sheet 2.

783

M. N. LOVELL.

CASH REGISTER AND INDICATOR.

No. 445,959. Patented Feb. 3, 1891.

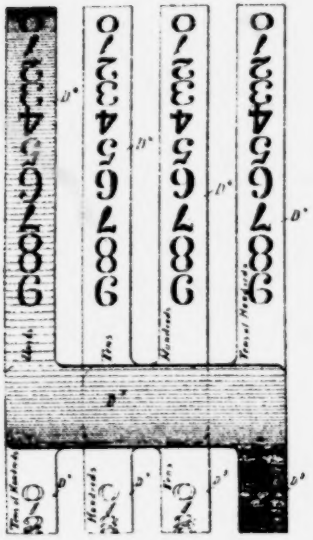

Fig. 4.

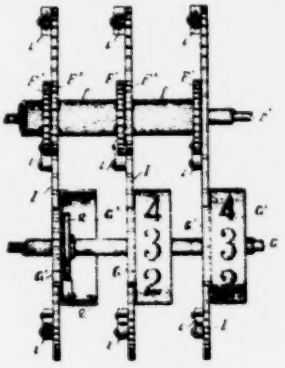

Fig. 3.

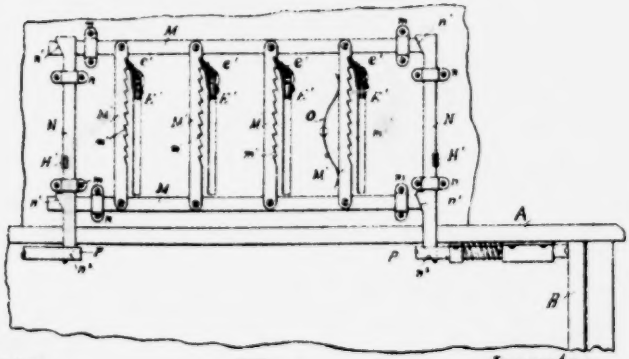

Fig. 5.

Witnesses.

C. F. Gunther

A. D. Robbins

Inventor.

Melvin N. Lovell

by his attys

Hallock & Hallock

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No. Model.

3 Sheets—Sheet 3

M. N. LOVELL.

CASH REGISTER AND INDICATOR.

No. 445,959. Patented Feb. 3, 1891.

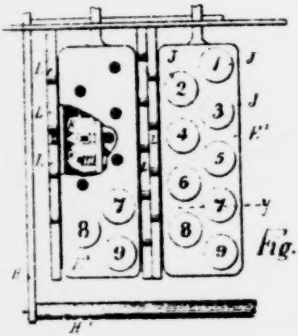


Fig. 6.

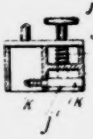
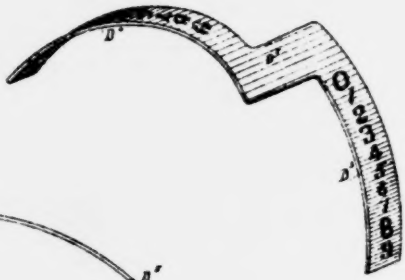


Fig. 7.

Fig. 9.



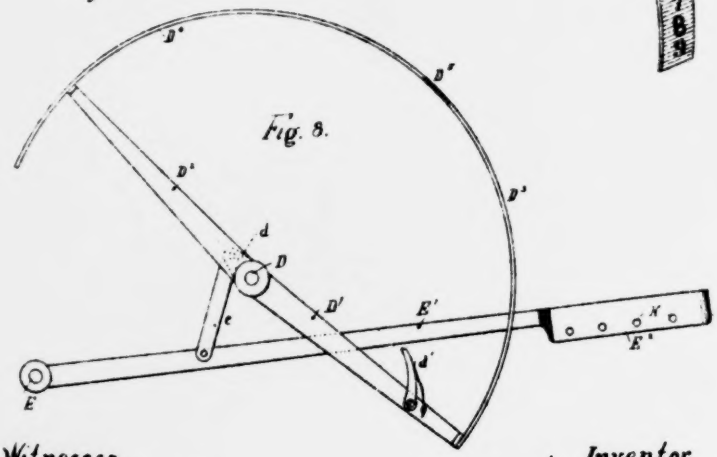


Fig. 8.

Witnesses.

Chas. P. Hughes

A. D. Dobbins

Inventor.

Melvin N. Lovell

by his atty

Wallace & Wallace

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UNITED STATES PATENT OFFICE.

MELVIN N. LOVELL, OF ERIE, PENNSYLVANIA, ASSIGNOR TO THE LOVELL MANUFACTURING COMPANY, LIMITED, OF SAME PLACE.

CASH REGISTER AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 445,959, dated February 3, 1891.

Application filed March 28, 1889. Serial No. 305,054. (No model.)

To all whom it may concern:

Be it known that I, MELVIN N. LOVELL, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Cash Indicating, Registering, and Accounting Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to that class of machines which are commonly called "cash indicating, registering, and accounting machines;" and it consists in certain improvements in the construction and operation of the same, as will be hereinafter set forth and explained, and pointed out in the claims.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a transverse vertical section view taken on the line *x x* in Fig. 2. Fig. 2 is a front elevation view with parts broken out to show internal construction. Fig. 3 is a top or plan view of part of the registering and accounting mechanism. Fig. 4 is a diagram view of the indicating mechanism. Fig. 5 is a front elevation view of the retaining and releasing mechanism, as will be more fully explained herein. Fig. 6 is a top view of a part of the key-board. Fig. 7 shows a detail of construction of one of the actuating-levers, and is a section on the line *y y* in Fig. 6. Fig. 8 is a side elevation of one of the actuating-levers and one of the indicators. Fig. 9 is a perspective view of one of the indicators.

The construction and operation of my device are as follows:

A marks an inclosing case, which has within its base a drawer B. In its upper portion is contained the mechanism, and at one side is a key-board.

A' A' are openings in the side of the case, through which can be seen the indicators and the figures marked thereon.

C marks a metallic frame-work, in which is supported the mechanism hereinafter described.

D is a central fixed shaft supported by the frame-work C, and on it are loosely journaled certain cog-wheels I and arms D'. The number of these wheels and arms is optional, or rather it is regulated by the amount the machine is designed to indicate. I show four sets of these parts, and the machine illustrated is intended to indicate and register sums within thousands; but if a machine were to register tens of thousands, then it would have five sets of wheels, arms, &c.

On a fixed shaft E at the back of the frame-work C are pivoted as many levers E' as there are wheels I and arms D' on the shaft D. Each lever E' is connected with its companion arm D' by a link *e*, which connects with the short end *d* of the arm D', and each arm D' is provided with a pawl *d'*, which engages with its companion wheel I. A downward movement of the lever E' will cause an upward movement of the long end of the arm D', and the pawl *d'* will cause a movement of the wheel I to the extent of the arc of movement of the pawl *d'*.

The extent of movement of the lever E' is regulated by peculiar mechanism as follows. On the end of each lever E' is a key-box E², in which are nine (9) keys J. When the lever is to be depressed, the operator will touch one of these keys J, according to the amount he desires to record and indicate. Each of the keys J is marked with a numeral, as shown in Fig. 6. When one of these keys J is pushed down upon, it yields before the lever carrying it yields, and as it yields it throws out from the side of the key-box E² a catch K. A continued pressure on the key causes the lever E' to be depressed.

On the frame at the sides of the key-box E² there are stepped frame pieces or plates L, which will come in contact with the catch K, which has been pushed out from the side of the key-box by the key J and arrest the action of the lever E'. Thus if a key J having thereon the numeral 3 is pressed upon the lever E' can only be depressed until the catch K, actuated by the key just named, comes in contact with the proper step on one of the plates L, and if a key J having thereon the numeral 9 is pressed then the lever can be depressed until the catch moved by that key

comes in contact with the lowest step of the plates L. It will now be understood that the degree of movement of the lever E' is regulate l by the key that is pressed upon to actuate the lever E', and the degree of movement of the lever E' regulates the degree of movement of the wheel I, which is moved by that lever. Thus if the lever E' is moved down by pressing the key marked with the numeral 3 it will go down until stopped by the third step of the plates L, or, let us say, three spaces, and it will move the gear-wheel I three cogs, and if it is depressed by pressing key 9 then it will move the wheel I nine cogs.

The means by which the key J extends a catch at the side of the key-box E² is a matter of choice or selection of many devices which will quickly suggest themselves to a mechanic. In Figs. 6 and 7 I show an operative construction for this purpose. The key J has a stem J', on which is a reacting spring j, and at its end there is a bevel j', which fits in a slot in a bolt or catch K, which has a reacting spring k.

The indicating appliance is as follows: Attached to each arm D' is a curved narrow plate D², the curve of which has the shaft D for its center. On this plate are marked the numerals 0, 1, 2, &c., to 9, beginning at the top and reading down. (See Fig 2.) As the lever E' is depressed, the arm D' is moved up and the indicator-plate D² is moved past the opening A' in the case. If the lever E' is depressed by pressing on the key 3, the lever is moved down three spaces and the arm D' is moved up proportionately, and so the number 3 is exposed at the opening A' at the front of the machine above the keys.

In order to exhibit numerals at the opening A' at the back of the machine simultaneously with those at the front of the machine and have them read from the left to the right, I mount similar plates D³ on like arms D⁴ and connect the plates D² and D³ together by webs or plates D⁵. This is clearly shown in Figs. 3 and 4. To aid in supporting these indicators, I put rollers c on the tie-rods C' of the frame-work, as seen clearly in Fig. 1. It will be seen that in effect these indicators are two arcs or circles connected by horizontal bands or webs. One arc is at one side of the machine and the other at the other, and one is at the right of the center of the machine and the other at the left, calling the key-board the front of the machine, and the numerals on one are read from the top to the bottom and on the other from the bottom to the top. When, for example, the numeral 3 is displayed at the units-place at the front of the machine, it is also displayed at the units place at the back of the machine, so that to a person standing at the back of the machine and facing the operator, who is at the front of the machine, the numerals will read from left to right. When a lever is depressed, it should be retained in such position until it is desired to release it. The means by which I effect this result are as follows: Immediately back of the key-board and just inside of the case is a rack consisting of horizontal bars M and vertical bars M'. (See Fig. 5.) The horizontal bars M are held in guides m, so that they can move easily horizontally. The vertical bars M' stand by the side of the levers E', and they have ratchets on their sides with which pawls e' on the levers E' engage. Whenever a lever E' is depressed, the pawl e' will catch on the ratchet m' and hold the lever down. At each end of the rack just described there are vertically-movable bars N, which are guided in loops n. On the sides of these bars N there are inclines n', which bear upon proper faces on the bars M. By drawing down the bars N the bars M will be moved horizontally, and this will carry the ratchet-bars M' away from the pawls e', and thus leave the levers E' free to react. On each side of the key-board there are levers H', which are pivoted at H, and they are tied together by a bar H², which lies along the front of the machine. (See Figs. 1 and 2.) The levers H' are connected with the vertical bars N, as seen at H' in Fig. 5. Whenever the operator wishes to release the depressed keys, he will press down on the bar H². On the bottom of the bars N there are other inclines n², which act upon spring-bolts P to draw them back. These spring-bolts hold the drawer B from being drawn out. Therefore when it is desired to open the drawer the operator must depress the levers H'.

The registering and accounting mechanism is in many respects the same as that shown in Letters Patent of the United States No. 41,898, dated March 13, 1864, issued to Joseph B. Alexander for improvement in calculating-machines, and will therefore not be broadly claimed by me of itself. Its construction and operation are as follows: The wheels I have cogs in sets of ten—that is to say, they have twenty, thirty, forty, or fifty cogs, as desired. As shown, they have fifty; but I think wheels of thirty cogs would be equally desirable, and perhaps more so. Opposite each tenth cog on the wheel I there are dogs i, which act upon the cogs of a gear F', which is loose on the shaft F. This cog-gear F' is connected with a gear F² by a sleeve f, and this last-named gear F² meshes with the next adjoining wheel I. Whenever a wheel I is moved ten cogs, the next adjoining wheel I to the left is moved one cog through the action of the dogs i and gears F' and F². Now let the wheel I at the right of the mechanism represent units, the next to the left tens, the next hundreds, and so on. When the units-wheel has been moved ten spaces, the tens-wheel will be moved one space, and when the tens has been moved ten spaces the hundreds will be moved one space, and so on. On the shaft G there are loosely journaled gear-wheels G', G there are loosely journaled gear-wheels G', which have ten teeth or cogs, and they carry drums G², on which are marked the numerals. These drums may be loosely journaled on the hubs of the gears G' or on the shaft G and

have motion communicated to them from the gears i' by a pawl and ratchet q q' or other clutching device. By this means the drums may be rotated backward by the hand to set them all to the zero-line before starting the mechanism. The gears G' and drums G^2 are for registering the number of spaces that the wheels I may be moved. Before starting the machine each wheel I should be set with one of the dogs i' just escaped past the gear I'' and all the drums G^2 with their naughts at the reading-line. The machine being thus set, the case should be closed and parts be left undisturbed, except as operated by the keys.

The operation of the machine will be as follows: Let us suppose that the operator wishes to record a sale amounting to $12.56. He may do it by pressing key 1 on the left-hand lever, key 2 on the next lever to the right, key 5 on the next lever to the right, and key 6 on the right-hand lever, or he may work from right to left, or he may follow no successive action, the result will be the same—to wit, the indicators will display at the openings A' in the case the figures 1 2 5 6, and on the drums inside the figures 1 2 5 6 will be on the reading-line. The operator will then depress the bar H', which will release the levers E', and they will all resume their normal position, the indicators will all show naughts at the openings A'; but the drums G^2 in the case will stand, as above stated, with the figures 1 2 5 6 in line. If the next sale to be recorded should be $1.64, the drums G^2 would be moved so as to read 2 6 2 0, which is the sum of 1 2 5 6 and 1 3 6 4, while the indicators would show at the openings A' the figures 1 3 6 4, the amount of the last sale recorded.

The means for exacting the levers E' and the indicators are not shown, as they may be greatly varied and will not be claimed as forming any part of the invention, but they will probably be springs properly applied to the levers E or the arms D'. To prevent the wheels I being thrown too far over by the action of the levers, I employ a brake, which consists of the spring Q, which has its free end in contact with the edges of the wheels, as seen in Fig. 1. It may be well to observe that of the keys J on the levers the one marked 9, which is the last one at the outer end of the key box E, need have no catch-action connected with it, for the last catch of the series may be dispensed with, in fact, the end of the key box itself may serve as a stop. Therefore, when in the following claims these keys and catches are referred to as having mechanical action of any kind this exception should be assumed as reserved. I do not desire to be limited to the use of the stepped plates L as an essential element of the construction, although they are probably the most convenient appliance for the purpose.

What I claim as new is—

1. In a machine for the purposes mentioned, the combination of a series of setting-levers, one of which is to be used for indicating units, the adjoining lever for tens, the next lever for hundreds, and so on throughout the series, a series of nine keys carried on each of said levers, which are marked consecutively with the nine digits, each of which keys will effect a limitation of the movements of said lever according in degree to the digit on the key used to depress said lever, and an indicator moved by each of said levers, which displays any of the nine digits according to the degree of movement of the lever by which it is actuated.

2. In a machine for the purposes mentioned the combination of two series of indicator-plates arranged to face from opposite sides of the machine, each of which plates has marked thereon the numerals in successive order, the plates of each series being intended to designate units, tens, hundreds, &c., respectively, in successive order from right to left, as viewed by observers on opposite sides of the machine, and connections connecting the plates of one series with those of like designation in the other series, so that a movement of a given plate of one series will cause the like plate in the other series to move correspondingly, whereby as the plates of one series are moved to indicate a given amount the plates of the other series will be moved to indicate the same amount in like manner.

3. In a machine for the purposes mentioned, the combination of a series of setting-levers, one of which represents units, one tens, another hundreds, and so on throughout the series, a series of nine keys carried on each of said levers, which are marked consecutively with the nine digits, each of which keys will effect a limitation of the movement of said lever according in degree to the digit on the key used to depress said lever, an indicator moved by each of said levers, which displays any of the nine digits according to the degree of movement of the lever by which it is actuated, a pawl-and-ratchet attachment for retaining each of said levers at any degree of depression, and a releasing mechanism for releasing all of said levers simultaneously from the engagement of said retaining attachment.

4. In a machine for the purposes mentioned, the combination of a series of setting-levers which represent, respectively, units, tens, hundreds, &c., a series of keys carried on each of said levers, which represent the digits, each of which keys will effect a limitation of the movement of its lever according to the digit represented thereby, an indicator moved by each of said levers, which displays any of the digits represented by said keys according to the degree of movement of the lever by which it is actuated, a pawl-and-ratchet attachment for retaining each of said levers at any degree of depression, a releasing mechanism for releasing all of said levers simultaneously from the engagement of said retaining attachment,

a drawer, a catch for retaining said drawer, and mechanism for releasing said catch which is moved by the mechanism which releases the said setting-levers.

5. In a machine for the purposes mentioned, the combination of two series of indicators, one on each side of the machine, each indicator of each series being intended to indicate units, tens, or hundreds, and so on, according to its position relatively in the series, the arrangement being such that sums indicated on either series shall read properly to an observer facing the same, connections so connecting the indicators of one series with those of the other of like designation that like indicators in both series will move correspondingly and simultaneously, and a series of setting-levers, each of which operates one of the said connected sets of indicators.

6. In a machine for the purposes mentioned, the combination of two series of indicators, one on each side of the machine, each indicator of each series being marked with the numerals in successive order, the numeral displayed by it depending on the degree of movement which may be imparted to the indicator, each of which indicators also being intended to indicate units, or tens, or hundreds, and so on, according to its position relatively in the series, the arrangement being such that sums indicated on either series shall read properly to an observer facing the same, connections so connecting the indicators of one series with those of like designation in the other series that like indicators in both series will move correspondingly and simultaneously, setting-levers for moving each of the thus connected sets of indicators, and a series of keys and catches on each lever for limiting its degree of movement.

7. In a machine for the purposes mentioned, the combination of a series of setting-levers, one of which is to be used for indicating units, the adjoining lever for tens, the next lever for hundreds, and so on, a series of nine keys carried on each of said levers, which are marked consecutively with nine digits, each of which keys will effect a limitation of the movement of said lever according in degree to the digit on the key used to depress said lever, an indicator moved by each of said levers, which displays any of the nine digits according to the degrees of movement of the lever by which it is actuated, a series of registering wheels which are operated through the action of said indicators, and a series of carrying-gears, each of which effects a one-degree movement of the next higher registering wheel for every ten degrees of movement of its actuating-gear.

8. In a machine for the purposes mentioned, the combination with the setting-lever E', having means for limiting the movement graduationally, of a rocking indicator consisting of the curved plates D and D', connected together by the web D², substantially as and for the purposes set forth.

In testimony whereof I affix my signature in presence of two witnesses.

MELVIN N. LOVELL.

Witnesses:
JNO. K. HALLOCK.
WM. P. HAYES.

1254

(No Model.) 6 Sheets—Sheet 1.

791

C. CARR.

CASH INDICATOR AND REGISTER.

No. 468,329. Patented Feb. 9, 1892.

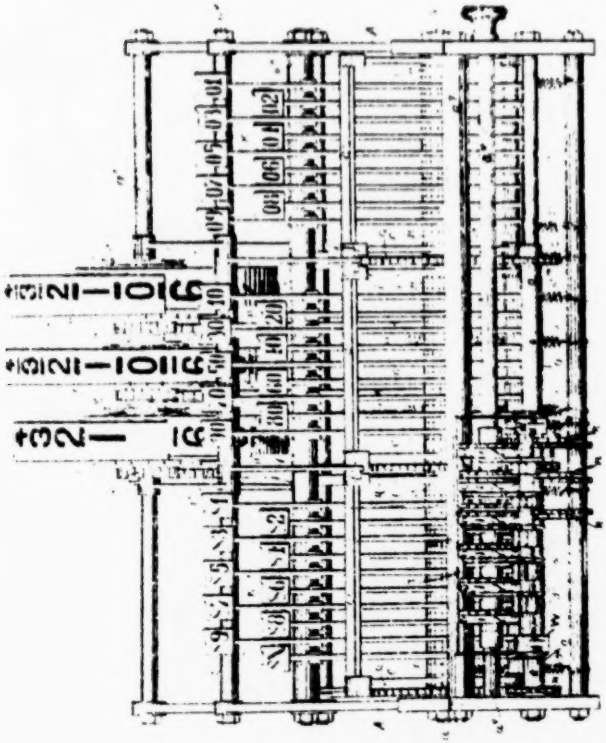

FIG 1

WITNESSES:

INVENTOR,

Charles Carr

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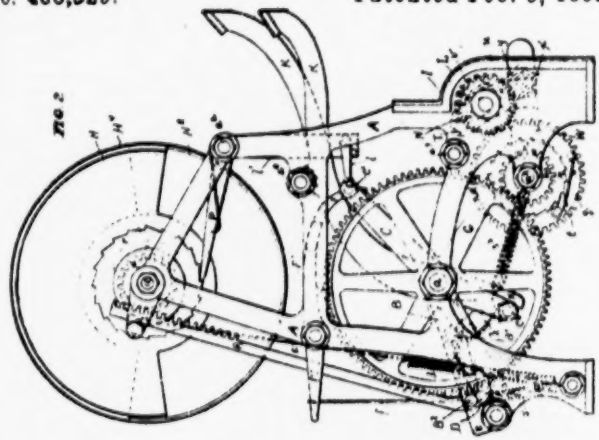
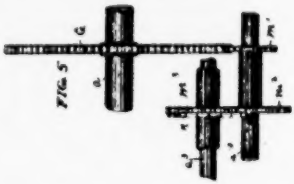
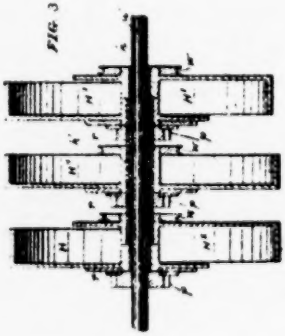
(No Model.) 793 C. CARR. 8 Sheets—Sheet 2

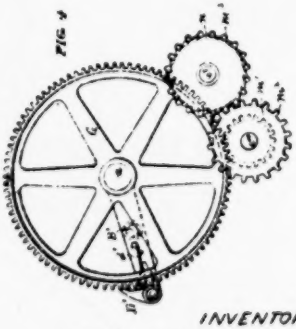
CASH INDICATOR AND REGISTER.

No. 468,329. Patented Feb. 9, 1892.









WITNESSES:
Howard G. Osborn
Waldo A. Martin

INVENTOR
Charles Carr

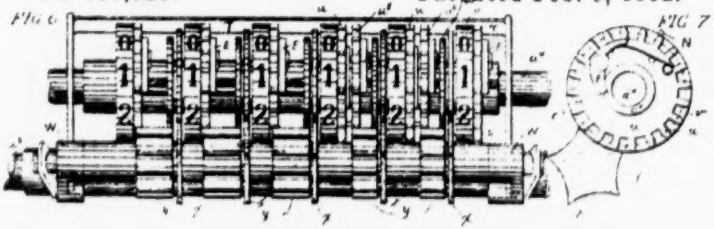
1256

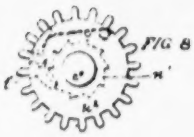
(No Model.) 795 6 Sheets—Sheet 3.

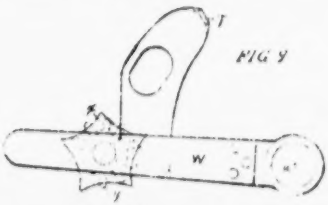
C. CARR.

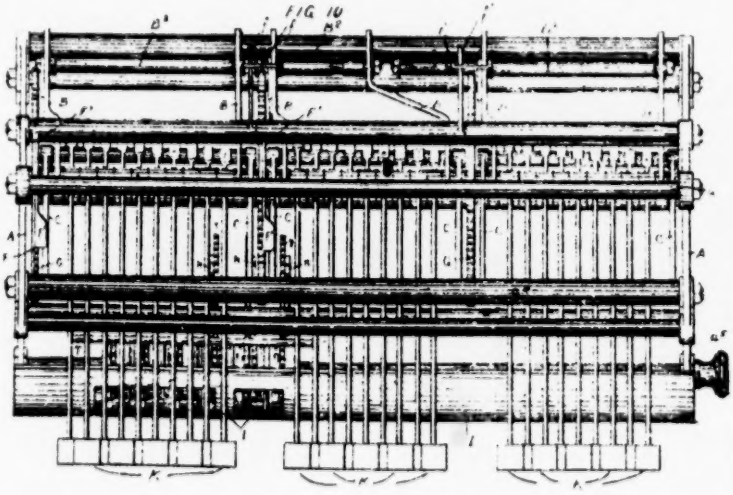
CASH INDICATOR AND REGISTER.

No. 468,329. Patented Feb. 9, 1892.









WITNESSES:
Howard L. Hyburn
Wilds A. Martin

INVENTOR.
Charles Carr

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(No Model.) 6 Sheets—Sheet 4.

C. CARR.

CASH INDICATOR AND REGISTER.

No. 468,329. Patented Feb. 9, 1892.

FIG. 11

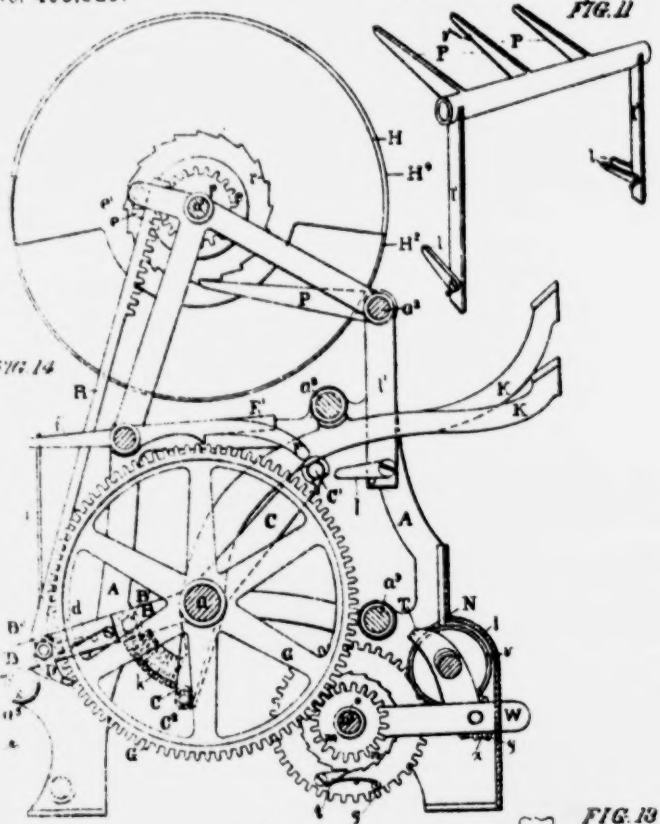
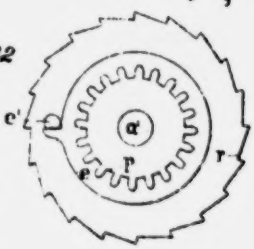


FIG. 14

FIG. 13

FIG. 12



WITNESSES:

INVENTOR:

Charles Carr

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(No Model.) 6 Sheets—Sheet 5

C. CARR.

CASH INDICATOR AND REGISTER.

No. 468,329. Patented Feb. 9, 1892.

FIG. 15.

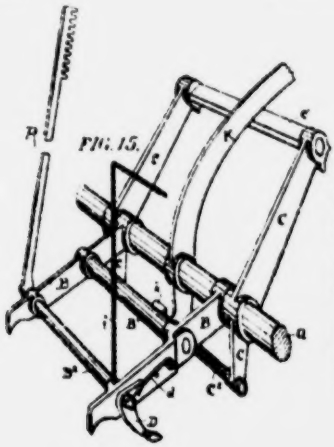


FIG. 17.

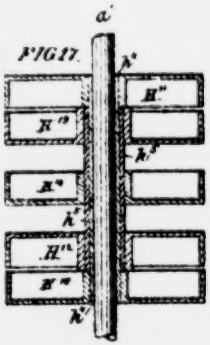
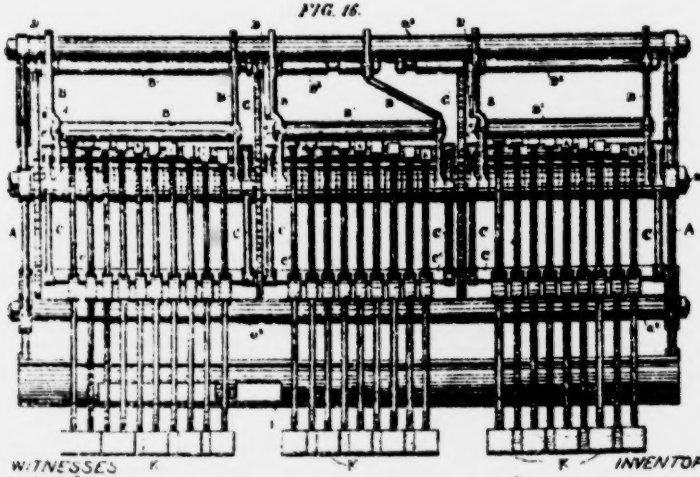


FIG. 16.



WITNESSES

INVENTOR,

Charles Carr

1259

(No Model.) 6 Sheets—Sheet 5

801 C. CARR.

CASH INDICATOR AND REGISTER.

No. 468,329. Patented Feb. 9, 1892.

FIG. 18.

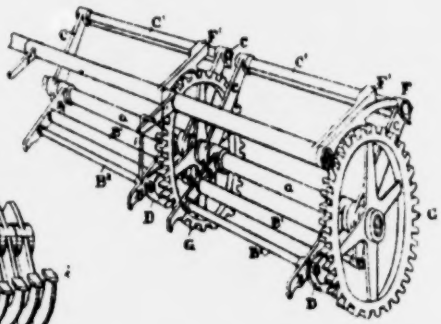


FIG. 23

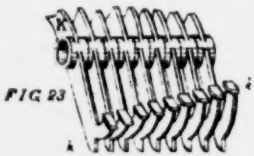


FIG. 10

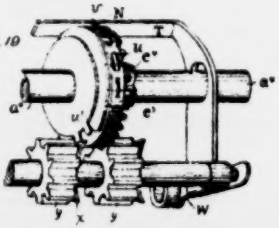


FIG. 21

FIG. 26.

FIG. 20

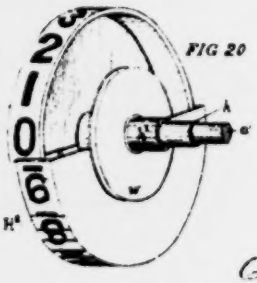


FIG. 22.

WITNESSES:
H. Schulmann
W. C. Martin

INVENTOR,
Charles Carr

1260

UNITED STATES PATENT OFFICE.

CHARLES CARR, OF BOSTON, MASSACHUSETTS.

CASH INDICATOR AND REGISTER.

SPECIFICATION forming part of Letters Patent No. 468,329, dated February 9, 1892.

Application filed November 26, 1890. Serial No. 372,737. (No model.)

To all whom it may concern:

Be it known that I, CHARLES CARR, of the city of Boston, county of Suffolk, and State of Massachusetts, have invented certain new and useful Improvements in Cash Registering and Indicating Machines.

The following, together with the accompanying drawings, having reference-letters, herein referred to, is a full and exact description of said invention.

The nature of this invention relates to the indicating and registering devices in a cash registering and indicating machine; and it consists in general of the decimal registering-wheels, the indicating-wheels, and their cooperative and connecting parts and their combinations, substantially as hereinafter more fully set forth.

With reference to the drawings, Figure 1 is a front elevation of a registering apparatus embodying my invention, with the case removed. Fig. 2 is an end elevation of the same. Fig. 3 is a sectional front elevation of the indicating-wheels and their connecting parts. Fig. 4 is a side elevation illustrating a modification of the driving-gearing. Fig. 5 is a front elevation of the same. Fig. 6 is an enlarged front elevation of the adding mechanism. Fig. 7 is an end elevation of parts of the adding mechanism. Fig. 8 is also an end elevation of parts of the adding mechanism. Fig. 9 is an end elevation of the frame which holds the "Geneva stops" and transmitting-pinions. Fig. 10 is a plan showing the registering apparatus, with the indicating apparatus removed. Fig. 11 is a perspective view of the triple pawl for controlling the indicating-wheels. Fig. 12 is an end elevation of a portion of the device for driving or rotating the indicating-wheels. Fig. 13 is a plan view of the same. Fig. 14 is an enlarged sectional elevation. The section is taken just within and parallel to the left-hand end frame A. Fig. 15 is a view in perspective of a key-lever and the parts immediately related thereto. Fig. 16 is a plan of parts showing relations of keys, driving-gears, and connecting parts. Fig. 17 is a sectional elevation illustrating a possible modified arrangement of the indicating-wheels. Fig. 18 is a perspective view of the parts, as indicated by letters, for the purpose of further illustrating their relations and connections, particularly pawls F F'. Fig. 19 is also a perspective view of part of the registering mechanism, for a like purpose. Fig. 20 is a perspective view for further illustrating the construction and relations of parts H H' and related parts otherwise shown in Fig. 3, &c. Fig. 21 is also a perspective view, further illustrating the construction and relations of parts r, u, E, c^3, a^4, and N, and particularly c^4. Fig. 22 is a side elevation, and illustrates the construction of pawl D and its holding and yielding relations to wheel G. Fig. 23 is a perspective view, and is to illustrate the gradation in respect to differing lengths of the tappets k. Fig. 24 is a perspective view, and will serve to illustrate the relations of triggers l and the arrangement of two of them on one arm l' for the purpose of operating in connection with two adjacent yokes C C' C².

The frame of the machine, containing and supporting the operating parts, consists in general of two end plates or castings A. (See Figs. 1, 2, 10, 14, and 16.) These are connected by rods a and a' and other longitudinal parts, and may rest upon any suitable base or bed. An ornamental case of wood or metal may inclose the operating mechanism, with properly-located "sight-slots" to allow observation of the numbers on the indicating-wheels.

It is usual in machines of this class to provide a series of keys or levers, marked to indicate the most commonly occurring sums for which purchases are made, the depression of each lever, bringing into view a tablet marked with figures corresponding to the key or lever, and at the same time otherwise registering the amount of the purchase. In my device, as will be readily seen, the keys are arranged and graded in several groups, these groups corresponding in number to the number of digits in the greatest sums to be registered. I have shown three of such groups. This number may be increased, if desired. Each of these key-levers K, as will be seen by reference to Figs. 2, 10, 14, and 16, is provided with a finger-tap on its front end, and is pivoted at a, and has on its rear end the lifting-tappet k. The tappet on each lever varies in length from its neighbor according to the value represented by such lever. (Observe these variations in Figs. 2, 10, 14 16,

and 23.) Each group of key-levers K is inclosed by a yoke C' C² C³, pivoted at *a*. A pivoted frame B B' B² also incloses or spans each group of key-levers K.

The frame consists of arms B, pivoted at *a*, lifting-rod B², and a second rod B', against which the rear key-lever tappets operate. Hinged at rod B² upon this frame is a rack R, running upward to mesh with gear *p*, and a pawl D, meshing into wheel G. Also attached at B² is a hook-rod *f*, hooking upon the back end *f'* of pawl F'. (See Figs. 2, 14, 15, and 18.)

Wheels are employed for indicating as well as for registering. (See Figs. 3 and 17.) In Figs. 1, 3, and 20 they are reduced to one wheel's width for each front and rear reading by using a part-peripheried wheel playing in a similar one, these two parts being fast on different sleeves or shafts carrying similar ones in other positions, so as to secure a correct left to right reading at either the front or the rear of the machine. In Fig. 17 a similar result—*i. e.*, left to right reading—is secured with entire wheels, numbered on part peripheries, but they cannot be as in the other case condensed into the breadth of one wheel for the two reversely-numbered part peripheries. In the first instance, Figs. 1 and 3, H H' are for the "dollar" group of keys, H² and H³ for the "cent" or right-hand group, and the entire middle wheel H⁴ has one-half periphery numbered for each front and rear reading and is operated by the middle or "dime" group of keys.

It is obvious that the number of wheels may be varied to correspond to the number of groups of key-levers or the number of digits in the largest amounts to be indicated. If the number of groups is an "even" one, it will be readily seen that the middle wheel may be dispensed with and two sleeve-coupled wheels be used for each group of key-levers. These wheels all have a common axis in shaft *a'*.

Wheel H on the left and H' on the right (see Figs. 1 and 3) are fast on a common sleeve *h*, turning on shaft *a'*, and are set to face oppositely—viz., front and rear. Wheels H² on the left and H³ on the right are similarly fast on a common sleeve *h'*, which is free to turn on sleeve *h*. It will be readily seen that the wheels H and H' might be made fast to the shaft *a'*, in which case the shaft would have to turn in the bearings, and wheels H² and H³ with sleeve *h'* would turn on shaft *a'* instead of sleeve *h*. As may be observed, wheels H and H' are fitted to turn within wheels H² and H³, so that two wheels occupy only about the breadth of one wheel. Wheel H⁴ is an entire wheel and has one half of its periphery numbered to read from the front and one half from the rear, and is located between H H on the left and H' H³ on the right.

The modification shown in Fig. 17 represents wheels H⁵ and H⁶, numbered on opposite parts, as whole wheels fast to a common sleeve *h*⁴, which is free to turn upon shaft *a'*, (as before these wheels might be made fast to shaft *a'*, in which case the shaft must turn in its bearings,) and wheels H⁷ and H⁸ similarly numbered, also as whole wheels and fast to a common sleeve *h'*, which is free to turn upon sleeve *h*⁴, while the middle wheel H⁹, numbered like wheel H⁴ in Fig. 3 on opposite halves of its periphery, is free to turn upon sleeve *h'*.

The two arrangements are essentially the same, as both are composed of sleeve-coupled wheels, and the object sought is reached by either arrangement—*i. e.*, to have the numbers indicated read correctly from left to right, whether viewed from front or rear, and approximately opposite one to the other.

In the arrangement shown in Figs. 1, 2, and 3 the numbers indicated may be practically opposite to one another; but by the arrangement shown in Fig. 17 the wheels must be set aside enough to expose the figures without cutting the peripheries of the wheels, yet the numbers indicated can be made to show approximately opposite to one another and both read correctly from left to right. On wheels H H' the digits 0 to 9 are arranged for turning the wheels, as shown in Figs. 2 and 14, to the right, and they are thus made to appear successively at the right-slots in the front of the case. One set of digits on wheel H⁴ appear in like manner in front, and the other set in the rear. Those also on wheels H' and H³ appear at the rear sight-slots. On one side of wheels H, H', and H⁴ are fastened the ratchet-wheels *r*. (see Figs. 2, 3, and 14,) and beside ratchets *r* are pinions *p*, free to turn and carrying each a driver *e*, having a tooth or lug which by contact with pin *a'* drives ratchets *r*, and through them the indicating-wheels. Attached to wheels H', H³, and H⁴ are grooved wheels *w*, in which run cords *c*, which, fastened to them, are operated by springs *s* to turn the numeral-indicating wheels backward when released, as otherwhere described. Upon the shaft *a*³ in front of these wheels (see Figs. 2 and 14) is a triple pawl P, which has two downwardly-projected arms *l'*, which carry at their lower ends the triggers *l*, one to act on each of the yokes C' C² C³. The three fingers of pawl P each engage one of the ratchets *r*, and so control their action and that of their respectively connected indicating numeral wheels, as will further appear.

The indicating operation is as follows: When one of any or each of the series of keys K is pulled forward and downward it carries also the bail or yoke C' C² C³. The upper end of yoke C' strikes the trigger *l* upon the arm *l'* of the triple pawl P, causing said pawl P to turn upon the pivotal rod *a*³, thereby releasing the ratchet-wheels *r*. If any of the said indicating-wheels have been previously turned from their normal or zero positions, they immediately return by force of the springs *s* acting through the cords *c* upon the grooved

wheels *n*. (Weights may, if preferred, be employed in place of springs *s*.) As the key K moves still farther the tappet *k* strikes against the cross-bar B′ of the swinging frame B and carries said frame with it. At the outer end of each of these frames B is a second cross-bar B^2, to which are attached the racks R, as previously stated, which are pushed upward by the motion of the frames B, and which turn the pinions *p*, and with pinions *p*, by means of the attached disk *e* and pins e^2, the ratchet-wheels *r* and their respectively connected indicating-wheels, said disk *e* having a tooth or lug by which it acts against pin e' for said purpose. Said ratchets and indicating-wheels are retained in the position to which they are turned by the triple pawl P, which has been released by the yoke C in passing trigger *l*, and brought again into retaining contact with ratchets *r* by means of a spring. (See Fig. 2.)

On the periphery of the indicating-wheels are arranged the digit characters 1, 2, 3, 4, 5, 6, 7, 8, 9, and 0, and, as the tappets *k* vary each in length from its neighbors in proportion to the numerical value of the key-lever, (see Figs. 2, 10, 14, 16, and 23,) the motion of key K is uniformly limited by rods a^4 and a^5, attached to the frame. Thus the indicating-wheels will be turned through an arc corresponding in length to the value of the corresponding key, and the proper digits will be brought before and retained at the sight-slots. To return to the motion of the frames B as they move upward propelled by the action of the levers K and tappets *k*, the pawls D, one of which is attached to the rear end of each of the frames B, (see Figs. 14 and 18,) slip over a number of teeth in the driving-gears G, one of which is provided for each series of keys, (see Figs. 1, 2, 10, 14, 16, and 18,) corresponding to the numerical value of the keys, and by the action of the springs *d* (see Figs. 2, 14, and 15) are held into gear in the said driving-gears G during the return of the frames B to normal position, which return is accomplished by means of springs *s*. (See Fig. 2.) By reason of the pawls D being held into gears G, it is obvious that said gears must turn during the return of the frames B and pawls D to their normal positions, and the angle through which they turn corresponds to the value of the key being used.

In order to more fully explain how the motion of gears G is transmitted to the adding mechanism, I will take for illustration only the first or right-hand gear G, which corresponds to the cent series of keys. (See Figs. 1, 2, 10, 14, and 16.) The pinion *m* meshes into gear G and is turned by it, the pinion *m* and a ratchet *n* being both fast to a common sleeve *o*, (see Figs. 1 and 14,) which is free to turn on shaft a^2, (see Figs. 1, 2, and 14,) the ratchet *n* must turn with pinion *m*. Beside ratchet *n* is a pinion *q*, which is driven by ratchet *n* through pawl *l*, and which in turn drives a gear *u* of the adding mechanism. In the case under consideration this is the right-hand gear *u* (see Fig. 6) or the one on the cents or unit digit-wheel *v* of the adding mechanism. As the digit-wheel *v* approaches a completion of its revolution it is necessary to "carry" the amount to the next higher wheel, which is accomplished by means of the Geneva stop *x*, transmitting-pinion *y*, and segmental gear *u′*, (see Figs. 6 and 19,) a device in common use for the purpose. The motion of the gears G corresponding to the dime and dollar series of keys is transmitted in a similar manner to the gears *u* of the second and third digit-wheels, respectively. In order that the motion of these latter wheels shall not affect the wheels of the lower digits, I have arranged the gearing as shown in Figs. 6 and 8—that is, I have placed beside the gears *u* of the second and third digit-wheels a second wheel u^2, and between gears *u* and u^2 a pawl *t′* and ratchet *n′*, fastened, respectively, to said gears. Thus, while gears *q* of the dime and dollar series may drive the digit-wheels corresponding each to each, the pawls *t′* shall slide over ratchets *n′*, and consequently not move the lower digit-wheels. It is also necesary in order to insure accuracy in registering that the three gears G, each representing a different series of keys and each driving a different digit-wheel of the adding mechanism must not drive at the same time, for if they do the process of carrying from one digit-wheel to the next might not be correctly effected. To accomplish the correct result, I have arranged that when the keys K of the dollar series start forward or downward, carrying with them the yoke C C″ C^2, a gravity-pawl F, (see Figs. 2, 10, 14, and 18,) which has been held out of contact with gear G of the dollar series by means of contact with yoke C, shall drop into mesh with gear G and prevent its movement until said pawl F has been again raised by the return of yoke C. In addition, pawls F″, having tubular bearings and arms *f′*, (see Figs. 2, 10, 14, and 18,) are arranged above gears G of both the dime and dollar series, so that when the frame B of the series next below is in its normal position, it shall hold pawls F″ out of gears G by means of the hooks *f* and arms *f′* of the pawl F″. The gear G of the cent series is free to turn. To illustrate the operation of these pawls and gears suppose that one of the keys K in each series has been pulled downward at the same movement. The pawls D have, as has been described, passed a number of teeth corresponding to the value of their respective keys engaged with gears G and the springs *s′* are exerting a force sufficient to return frames B and pawls D to a normal position. When the keys K are released the springs *s*, attached to yoke C, (see Fig. 2,) draw them back to their normal position and at the same time—*i. e.*, during the return stroke—the springs *s′* draw downward the frame B of the cent series, turn-

ing gear G of that series, and the pawl F has been lifted by the bail C. As frame B of the cent series reaches its normal position, the hook *f*, attached to said frame, pulls downward an arm *f'* of pawl F' of the dime series, releasing gear G of that series, when by force of springs *s'* the frame B of dime series is drawn downward, turning gear G of that series and releasing gear G of the dollar series in a similar manner, allowing it to be turned by force of pawls D and springs *s'*. If only the dollar and cent series are in use, the pawls F' perform no functions; but the gear G of the cent series is actuated as before, while the gear G of the dollar series is held by gravity-pawl F until the completion of the return stroke of keys K and bail C, when said pawl F is lifted by bail C, allowing gear G to be turned by pawl D and springs *s'*.

In Figs. 4 and 5 I have shown a modification of the gearing, &c., that may be applied to one of the series of keys, preferably the cent series. The frame B' carries at its outer end the pawl D', which acts in a reversed direction to the action of pawl D. By means of the pawl D' the keys of the series drive gear G in the forward stroke, and to reverse the direction of motion I have introduced a shaft a^{10}, carrying pinions m' and m^3, which are fast one to the other and drive pinion m^2. Pinion m^2 is attached to ratchet *n*, which drives pinion *q* and the adding mechanism. By using this modification the first or cent series of keys will drive on the forward stroke, the dime or second series on the return stroke, when the third or dollar series will be released by pawls F and F', as has been already described. In order that the digit-wheels of the adding mechanism may be easily set at the zero position, I have hung the Geneva stop *x* and transmitting-pinions *y* in a swing or frame W, pivoted on a^4, (see Figs. 2, 6, 7, 9, 14, and 19,) so that the series of Geneva stops and pinions may be swung out of the mesh with the adding mechanism. At the same time a cross-bar T, also attached to the swing W, rests upon the periphery of the digit-wheels. At the side of the gears *u* a collar c^4 is made fast to shaft a^4, which can be turned by the thumb-nut a^5. An inclined stop c^5 in collar c^4 presents a surface for a pawl E to act upon, said pawl E being pivoted to gear *u*. By turning shaft a^4 to the right (see Figs. 1, 7, 10, and 21) the stop c^5, through pawl E, turns the gear *u* until pins N in the peripheries of the digit-wheels strike the cross-bar T, when the pawls E, having inclined ends for the purpose, as shown in Figs. 7 and 21, slip over the inclined stops c^5 and allow the shaft a^4 to turn until all the digit-wheels are in a similar position. The figures on the digit-wheels are so arranged that with the said wheels in the above position the figure 0 will appear at the opening I, in the plate I. (See Figs. 2, 10, 14, and 16.)

The devices thus described have the advantage over other similar ones in use of being more positive in action, more simple and durable, and of performing more general and extended registration. The parts may be made of the materials ordinarily used in the construction of this and similar classes of machines.

Having described my invention, what I claim is—

1. In an indicating-machine, a middle reciprocating rotary indicating-wheel having upon each opposite half of its periphery a set of digits, one set reading from the front, the other from the rear, in combination with two or more similar wheels on either hand of said middle wheel mounted on a shaft and sleeves, one of the wheels on the left having a part-periphery set of digits which reads in front, is fast to a sleeve common to one of the wheels on the right, which has a part-periphery set of digits reading from the rear, and vice versa, one of the wheels on the right having a part-periphery set of digits reading from the front, is connected by a common sleeve to a wheel on the left having a part-periphery set of digits reading from the rear, the middle wheel being free to turn uncontrolled by the others upon one of said sleeves as a bearing, as are said sleeve and its wheels upon the second sleeve and said second sleeve and its wheels upon its shaft, each set so connected being operated by suitable mechanism, whereby the said digits may be made to express sums reading correctly from left to right whether viewed from front or rear, substantially as described.

2. In an indicating-machine, the middle indicating-wheel having a reciprocating rotary motion and reading each half from an opposite direction, in combination with two other indicating-wheels having a similar motion and mounted to read in radial opposition one to the other upon a common sleeve to which they are fast, said middle wheel being between the other wheels and loosely mounted upon their common sleeve, with suitable operative mechanism for the purpose of expressing numbers containing more than one digit, substantially as described.

3. In an indicating-machine, the middle indicating-wheel having a reciprocating rotary motion and reading each half from an opposite direction, in combination with one or more front and one or more rear reading-wheels upon either hand of said middle wheel and all having a common axis in connecting shaft and sleeves, and operating mechanism for the purpose of expressing numbers containing several digits, substantially as described.

4. In an indicating-machine, the combination of groups of key-levers and indicating-wheels having a reciprocating rotary motion, each group of key-levers and its two corresponding wheels, one of which reads from the front and one from the rear, representing a progressive degree in notation, said wheels being rigidly coupled by means of sleeves and

shaft and all having a common axis for the purpose of indicating numbers containing one or more digits, substantially as described.

8. In an indicating-machine, one or more sets of two sleeve-coupled indicating-wheels, one in each set reading from the front and the other from the rear, having a reciprocating rotary motion, in combination with an intermediate wheel having a similar motion and bearing on the opposite halves of its periphery sets of digits, one set reading from the front and the other from the rear, with suitable operative mechanism for the purpose of expressing numbers containing several digits, substantially as described.

6. In an indicating-machine, the combination of two indicating-wheels mounted upon and fast to opposite parts of a common sleeve and in radial opposition to one another and having a reciprocating-rotary motion with two other like indicating-wheels similarly mounted upon a common sleeve, said sleeves having a common shaft and axis, and suitable operative mechanism for the purpose of expressing numbers containing several digits, substantially as described.

7. The combination of the several sets of indicating-wheels rigidly shaft and sleeve coupled, reading from opposite directions, and having a reciprocating-rotary motion with suitable operative mechanism for the purpose of expressing composite numbers—i. e., numbers composed of several digits, substantially as described.

8. In an indicating-machine, the several sets of indicating-wheels rigidly shaft and sleeve coupled, reading from opposite directions, and having a reciprocating rotary motion, in combination with the intermediate free wheel having a similar motion and bearing upon opposite halves of its periphery oppositely-reading digits, and operative mechanism for representing composite numbers, substantially as set forth.

9. In an indicating-machine, two separately-moving indicating-wheels mounted contiguously side by side upon a common shaft, the rim of one overlapping the rim of the other, thus bringing the two wheels into practically the width space of one, each of these rims bearing upon its periphery a set of digits and each reading from a different point of observation, substantially as described.

10. In an indicating-machine, two sets of indicating-wheels, one set composed of a front and a rear reading-wheel mounted on opposite parts of a common sleeve, the other set composed of two similarly-reading wheels mounted on opposite parts of a common shaft, the sleeve of the first set being mounted and turning upon the shaft of the second set, and the adjacent wheel-rims turning one within the other, whereby the four wheels occupy practically but the width-space of two, substantially as described.

11. A set of two-part periphery-numbered numeral-wheels, one wheel playing within the other, in combination with a second similar but reversely-reading set, also playing one within the other, each of the first set being rigidly coupled on a common axis in radial opposition to one of the other set, substantially as described.

12. In a registering-machine, the combination of groups of operating key-levers, each representing different progressive degrees in notation, the yokes C C′ C², triggers *l*, the pawl P, arms *l*′, ratchet-wheels *r*, springs *s*, cords *c*, and grooved wheels *w*, substantially as and for the purpose set forth.

13. In an indicating-machine having groups of key-levers, each group representing a different degree in notation, the combination, with each group, of frames B, rack R, pinions *p*, driver *e*, pin *e*′ for turning the indicating-wheels, and the yoke C C′ C², trigger *l*, multiple-pawl P, arm *l*′, ratchet *r*, springs *s*, cord *c*, and grooved wheel *w* for the purposes of retaining, releasing, and returning the indicating-wheels, substantially as described.

14. In an indicating-machine, the combination of the key-levers, frame B, rack R, operated by pivot connection to rear end of frame, the pinion *p*, numeral-wheel, pin *e*′, ratchet-wheel *r*, and driving-disk *e*, substantially as described.

15. The combination of the key-levers constructed with the relatively-graded lever-tappets *k*, acting directly upon rod B′, the frames B B′, pawls D, gears G, pinions *m*, ratchet *n*, pawl *t*, gears *q*, and the registering device, substantially as described.

16. The combination of the key-levers, by means of frame B, rack R, pinion *p*, ratchet *r*, pin *e*′, and disk *e*, with the indicating-wheels, and, by means of frame B, pawl D, wheel G, pinion *m*, ratchet *n*, pawl *t*, and wheel *q*, with the registering device, substantially as described.

17. The combination of pawl P, arm *l*′, trigger *l*, yoke C, ratchet *r*, and the key-lever for releasing and controlling the movement of the indicating-wheels by means of said ratchet *r*, substantially as and for the purpose set forth.

18. The combination of the frame B, rack R, pinion *p*, ratchet *r*, pawl P, arm *l*′, trigger *l*, and yoke C with the key-lever for operating and controlling the movements of the indicating-wheels, substantially as described.

19. The combination of the retaining pawls F′, gears G, frames B, hooks *f*, pawls D, key-levers K, and the adding mechanism, substantially as and for the purpose set forth.

20. The combination of yoke C and its rod C′, interposed between and acting alternately upon trigger *l* of arm *l*′ of pawl P, and the pawl F, substantially as and for the purpose set forth.

21. The combination of gear *u* and its slipping-off pawl E and collar *c*′ with its inclined stop, the shaft *a*′, the numeral-wheels, pins N, and stop T, substantially as and for the purpose set forth.

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22. The combination of wheel a^3, ratchet a' pawl l', gear u, numeral-wheel v, and driving-gear g for the purpose of turning the numeral-wheels independently of the numeral-wheels of lower value, substantially as described

23. The combination of swing W, constructed with arm and stop-bar T and bearing the Geneva stop and carrying device, with the adding mechanism, whereby the transmitting-pinions may be thrown out of mesh with the gears of the adding mechanism to allow resetting, substantially as described.

24. In a registering-machine having groups of key-levers, each group on the forward movement setting suitable automatic operative mechanism for propelling an appropriate wheel of an adding mechanism, the combination of said key-levers, adding mechanism, and connecting operative mechanism with suitable automatic retaining and releasing mechanism, whereby a single key-lever of each group may be pulled forward at the same time, setting and retaining the operative mechanism, and on the return of said key-levers the operative mechanism corresponding to the several groups of key-levers will be automatically released one by one, allowing but one to transmit its movement to the adding mechanism at a time, substantially as set forth.

25. In an indicating-machine, several sets of indicating-wheels, each set composed of a front and a rear reading-wheel, which are fast to opposite parts of a common sleeve, the several sleeves having a common axis in a shaft and turning one within the other, and the adjacent wheel-rims also turning one within the other, whereby the several wheels are made to occupy practically but the width space of one-half the actual number, substantially as described.

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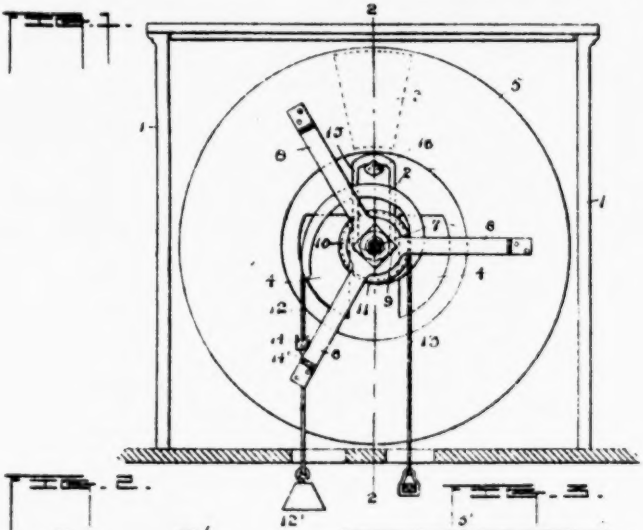
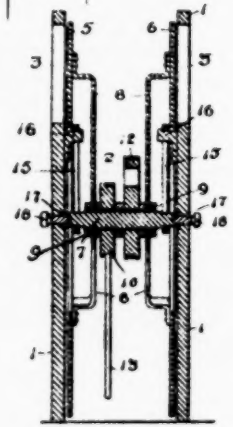
(No Model.)

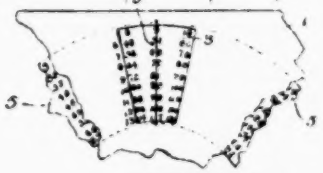
C. L. & P. C. WOODS.
PENDULUM SCALE.

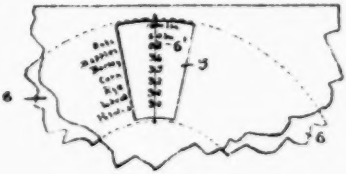
809

No. 510,948. Patented Dec. 19, 1893.









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UNITED STATES PATENT OFFICE.

CHARLES L. WOODS AND PERRY C. WOODS, OF CANTON, ILLINOIS, ASSIGNORS OF ONE-FOURTH TO SAMUEL H. ARMSTRONG, OF SAME PLACE.

PENDULUM-SCALES.

SPECIFICATION forming part of Letters Patent No. 510,948, dated December 19, 1893.

Application filed June 9, 1893. Serial No. 477,132. (No model.)

To all whom it may concern:

Be it known that we, CHARLES L. WOODS and PERRY C. WOODS, both residents of Canton, in the county of Fulton and State of Illinois, have invented certain new and useful Improvements in Weighing Apparatus; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

The invention relates to weighing apparatus and has for its object to improve the indicating devices and it consists in the matters hereinafter described and particularly pointed out.

In the accompanying drawings Figure 1 is an elevation one side of the cabinet being removed. Fig. 2 is a section on line 2—2 Fig. 1. Figs. 3 and 4 are details.

Numeral 1 denotes a cabinet or stand adapted to support and inclose the mechanism to be described. It has a window 3 on each side which may be glazed if desired and holes 4 which may be provided with covers pivoted or otherwise made movable. The openings 4 permit the manipulation of weights from without the cabinet and the windows allow inspection of the annuli or dials 5 and 6. These are preferably situated in suitable recesses formed in the walls of the inclosing structure. In front of these may be arranged any suitable pointer such as wires 5' and 6'.

The dials are made fast on an axis 7 by means of spiders or frames 8 having arms fixed to said dials and nuts 9 which are threaded to screw upon the axis against the frames and force them against other parts on the axis whereby said frames are firmly clamped in suitable situation. On the shaft or axis a spiral 2 and pulley 10 are also secured by any convenient means. To the former at point 11 near the axis is secured a chain or strap 12 which lies in the groove of the spiral and at its suspended end is connected to a weight 12'. Removable weights 13 can be attached as at 14'. To the pulley 10 a chain or strap 13 is also made fast and arranged to pass about said pulley in a direction opposite to that of chain 12. This strap or chain at its suspended end is connected to scale levers of any approved kind. These are usually concealed by a platform. They form no part of this improvement and are not fully shown in the drawings.

The shaft 7 is loosely supported on the bottom bar of stirrups 15 which in turn depends from the knife edge brackets 16 secured to the wall of the cabinet. These bottom bars are curved about the points of suspension of the stirrups as centers and in operation when the shaft and disks are turned the stirrups are moved or swung by friction to one side by the action of the shaft rolling upon said bar the shafts being held in place by the pins 18. The stirrups return to their normal position in vertical lines whenever the load is removed from the scales. By this construction the curved bearing bars which support the shaft are swung about their knife edge bearings and the friction of the shaft is materially reduced. The ends of shaft 7 are provided with cone shaped sockets 17 and the shaft is held against endwise and lateral movement by similarly shaped pins 18 which enter these sockets and are made adjustable from the exterior of the cabinet.

In Fig. 3 is illustrated means for indicating both weight and total cost. The numbers 1, 2, and upward on the dial 5 are designed to indicate weight, the weight of an object on the platform being denoted by the number under the wire 5. On the wall of the cabinet at the side of the window 3 are arranged numbers to indicate different prices per pound. Upon the dial are denoted the products of the various weights multiplied by the prices, these products being arranged in radial lines with respect to the weight numbers and circular lines with respect to the cost numbers. In the case illustrated in the drawings the weight indicated is 9. If the price be 10 the total value is indicated where the corresponding circular and radial lines cross as 9 0. The use of two dials as 5 and 6 affords a large range of indications and the indicating capacity of the second dial can commence at the maximum indication of the first. Instead of one of the dials having numbers corresponding to total cost, it may be supplied with others corresponding to measures, indicating for example the number of bushels. Referring to Fig. 1

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let various articles be noted on the cabinet and let the total weight of wagon and load as eighteen hundred be noted near the periphery of the dial and place on the dial opposite the various articles the number of bushels of said article corresponding to said total weight. Thus in the example given 60 opposite "oats" indicates that sixty bushels of oats will weigh eighteen hundred pounds and 30 opposite "wheat" indicates that thirty bushels of wheat will weigh the same. This of course implies that a bushel of oats weighs thirty pounds, and a bushel of wheat sixty pounds. Assuming then that the total weight of the wagon and a load of oats for example is eighteen hundred and that the weight of the same exclusive of the oats is six hundred, which latter weight must be separately ascertained, the number of bushels of oats is ascertained by dividing the weight of the tare, six hundred, by thirty which gives twenty as the number of bushels corresponding to said tare which being subtracted from the total 60 corresponding to the total weight eighteen hundred leaves the actual number of bushels of oats as forty. It will of course be understood that if the wagon be weighed separately on the same scales the dial will indicate its weight which weight will correspond to the number of bushels of any article indicated at the side of the name of such article. Thus in the case supposed the tare weight six hundred will be indicated near the circumference of the dial and the bushels twenty corresponding to such weight will be found below in the same radial line and opposite the word "oats."

We are aware that a disk provided with an index and with figures denoting price has been secured to the spring of a so called scale calculator and combined with a second disk in such manner that the first named disk could be adjusted by hand to indicate a given price and that thereupon when a desired weight was put in the scale pan it would be indicated near the periphery of the second disk and the product of the price by the weight displayed through an opening in said first named disk, and we are also aware that cabinets or cases have been provided with figures having correspondence with others marked on a dial and visible through a window in the cabinet, and such devices are not broadly of our invention. By our improvement we avoid the necessity of a special adjustment of any part to indicate particular prices or weights and of a special index and rely upon the weight acting upon the scales to disclose both the weight and the total price, the price per unit being always visible.

Having thus described our invention, what we claim is—

1. In a weighing apparatus the combination of a dial, a dial shaft provided with sockets in its ends, pins entering said sockets to limit endwise movement of the shaft, knife-edged supports, swinging stirrups depending from said supports to hold up the shaft, and weighing mechanism consisting of said shaft provided with a spiral 2 and pulleys 1, the chains 13 and 12 and the lever system, said chain 13 being connected to the proximate lever and chain 12 to a weight, substantially as set forth.

2. In a weighing apparatus comprising a dial shaft with sockets in its ends, pins entering said sockets to limit endwise movement of the shaft, knife edged supports, swinging stirrups depending from said supports to hold up the shaft, and weighing mechanism consisting of said shaft provided with spiral 2 and pulley 10, chains 13 and 12 and the lever system, a cabinet having a window, a dial provided with a circumferential row of figures to indicate pounds, figures on the cabinet to denote price per pound, and figures radially arranged on the dial in line with those denoting weight, said radially arranged figures denoting the multiples of the weight number when multiplied by the adjacent cabinet figures denoting the price per pound, substantially as set forth.

3. In a weighing apparatus comprising a dial shaft with sockets in its ends, pins entering said sockets to limit endwise movement of the shaft, knife edged supports, swinging stirrups depending from said supports to hold up the shaft, and weighing mechanism consisting of said shaft provided with spiral 2 and pulley 10, chains 13 and 12 and the lever system, a cabinet having a window, a dial provided with a circumferential row of figures to indicate weight, an index of articles adapted to be measured arranged on the cabinet and a series of numbers radially arranged on the dial in line with a weight number indicating the measure of the adjacently named article corresponding to the weight indicated near the periphery, substantially as set forth.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses

CHARLES I. WOODS
PERRY C. WOODS

Witnesses:
W. H. DRIGGS,
W. W. ELLIOT.

1269

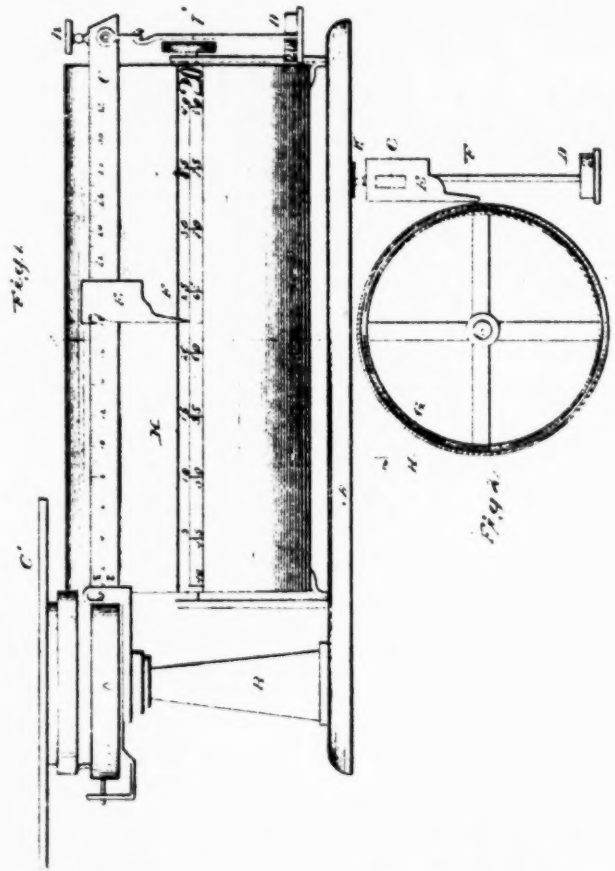
(No Model.)

L. F. KEPLER.

PRICE SCALE.

813

No. 514,475. Patented Feb. 13, 1894.



WITNESSES
J. M. Fowler Jr.
Chas. F. Stewart

INVENTOR
Lisle F. Kepler
by Church & Church
Attorneys

1270

815
UNITED STATES PATENT OFFICE.

LUTIE FLORENCE KEPLER, OF DAYTON, OHIO.

PRICE-SCALE.

SPECIFICATION forming part of Letters Patent No. 514,475, dated February 13, 1894

Application filed May 19, 1893. Serial No. 474,770. (No model.)

To all whom it may concern:

Be it known that I, LUTIE FLORENCE KEPLER, of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Price-Scales; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

This invention relates to improvements in that class of scales, usually even balanced scales, with which a balance weight or sliding poise is employed with a graduated beam to indicate the weight of the article placed on the platform, and a graduated price scale registering with a pointer on the poise and indicating the cost of the article, such price scale being usually movable and having a series of sets of graduations thereon, each set of graduations being computed at a different rate per unit, and it is the object of this invention to enlarge the capacity of such scales whereby the value of an article may be read instantly when its weight is greater than can be counterbalanced by the poise thereby necessitating the use of a removable counterpoise.

Broadly then, the invention consists in the employment of a double set of graduations, corresponding to any one price per unit, one set indicating the value of an article when balanced by the poise alone, and the other set indicating the value of an article when balanced by the counterpoise plus the poise.

The invention consists further in certain novel details of construction and combinations and arrangements of parts all as will be now described and pointed out particularly in the appended claims.

Referring to the accompanying drawings: Figure 1 is a front elevation of a scale constructed in accordance with my present invention. Fig 2 is a cross section on the line *x—x*.

Like letters of reference in both figures indicate the same parts.

The form of the balance scale illustrated, is well known, and needs no description further than to say that A indicates the base, B the standard having the bearings at the upper ends for the knife edge journals of the beam C which latter carries at one end, a platform C' of usual construction, and at the other end, a pendant D for the accommodation of supplemental counterpoise weights. In addition, the beam is provided with the usual graduations, as shown, running from 1 to 32 and indicating ounces, and upon this end of the beam there is mounted a sliding poise weight E, the weight of which serves to balance any article placed on the platform and not exceeding in weight thirty-two ounces or two pounds. This poise E is provided with an indicating end or surface preferably in the form of a depending finger F and in proximity to this finger or in position for its indications to register therewith, preferably when the poise is depressed, is a movable scale for indicating the cost at a given rate per unit.

For convenience in permitting the use of a wide range in the unit cost of articles to be weighed, the price scales or indications are preferably marked on the surface of a cylinder G or otherwise applied thereto, and the cylinder G is journaled to rotate in bearings of any suitable character, either carried by the base in position to have the indications register with the poise pointer as before mentioned, or mounted upon and balanced up with the scale beam, both these constructions being well known. In the form shown, the cylinder is mounted in bearings supported from the base of the scale, and it is provided with an inclosing case or stationary cylinder H having in the front side a relatively narrow aperture extending from end to end, and covered with a glass or other transparent plate through which the scale or set of indications for any one unit price may be seen and read. These sets of indications, it will be noted are arranged longitudinally of the cylinder and at one end the rate per unit is preferably added, in large figures, as shown in the drawings, the rate at the opening is twenty cents per pound and the upper set of indications shown, gives the total cost in cents of any article which the poise is capable of balancing at this rate, thus for sixteen ounces it will be twenty cents, for twenty-four ounces, thirty cents.

Now, as so far described, the use of the price scale is absolutely limited to articles which can be balanced by the sliding poise weight, and if it is too heavy for this and a

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counterpoise has to be added to the pendant D, the dealer must needs go through with all the calculations before necessary and the price scale is of practically no use. In order to avoid this, I now provide a second set of indications for each unit price, such indications being also adapted to register with the pointer on the poise and to indicate the cost of the article which will be balanced by the counterpoise, plus the sliding poise, that is to say, this second set of price indications will begin with a sum equal to the value of the counterpoise placed on the pendant D and as the indications progress upward, the value of the sliding poise is added to them and marked on the cylinder. As shown, the counterpoise is supposed to indicate a valuation of forty cents, thus the second set of cost indications begins with 40 and as the values of the sliding poise runs from 0 to 40 the indications in the second set will run up to 80, and the intermediate indications will vary accordingly.

The illustration given in the drawings and heretofore described is an exceedingly simple one, and may be readily grasped, but it will be seen by those skilled in the art, that the saving in the computations where the price per unit runs into fractions will be very great, and by this construction a price scale of most simple form may be made having a very wide range of usefulness, as the price indications may be given for any weight within the capacity of the scales, thus a dealer is entirely relieved from making computations and a purchaser is absolutely sure that the total price for a given article at any rate per pound is correct.

In the preferred construction, the second set of indications for each series at a given rate per unit is made of a different color, usually red, and is located below the set of indications for the sliding poise alone and as a convenient means for changing the rate per unit the cylinder is provided with a knob or handle I, at one end for rotating it to the desired point.

In order that the pointer on the sliding poise may always be brought to the proper point or the same point relative to the indications on the cylinder, the beam is provided with a finger piece or button K at the outer end, which may be used to depress it to the limit of its movement after the article has been balanced by sliding the poise along and adding counterpoise weights as is found necessary, thus in weighing any article and obtaining its cost, the cylinder is turned until the proper rate per unit is exposed through the opening in the casing, then the article is balanced up in the usual manner and the operator pressing his finger on the button K brings the beam down until the pointer on the sliding poise shows exactly the total price of an article of that weight and at that given price per unit.

Having thus described my invention, what I claim as new is—

1. In a price scale, the combination with the platform, beam, poise sliding thereon and removable counterpoise, of the price indicating scale with which the sliding poise registers, having two sets of indications one indicating the cost of articles balanced by the sliding poise and the other indicating the cost of articles balanced by the removable counterpoise plus the sliding poise, substantially as described.

2. In a price scale, the combination with the platform, beam, poise sliding thereon and removable counterpoise, of the series of indicating scales with which the poise registers, to indicate the total cost at given rates per unit, the indications for each unit price consisting of two sets of indications, one indicating the cost of articles balanced by the sliding poise and the other the cost of articles balanced by the removable counterpoise plus the sliding poise; substantially as described.

3. In a price scale, the combination with the platform beam, poise sliding thereon and removable counterpoise, of the series of movable indicating scales with which the poise is adapted to register to indicate the total cost at given rates per unit, the indications for each unit price consisting of two sets of indications, one indicating the cost of articles balanced by the sliding poise and the other the cost of articles balanced by the removable counterpoise plus the sliding poise; substantially as described.

4. In a price scale, the combination with the platform, beam, sliding poise and removable counterpoise, of the rotary cylinder having the series of indications or scales with which the sliding poise registers, each of the indications of said series consisting of two sets one set indicating the cost of articles balanced by the sliding poise and the other set indicating the cost of articles balanced by the sliding poise plus the counterpoise; substantially as described.

LITTIE FLORENCE KEPLER.

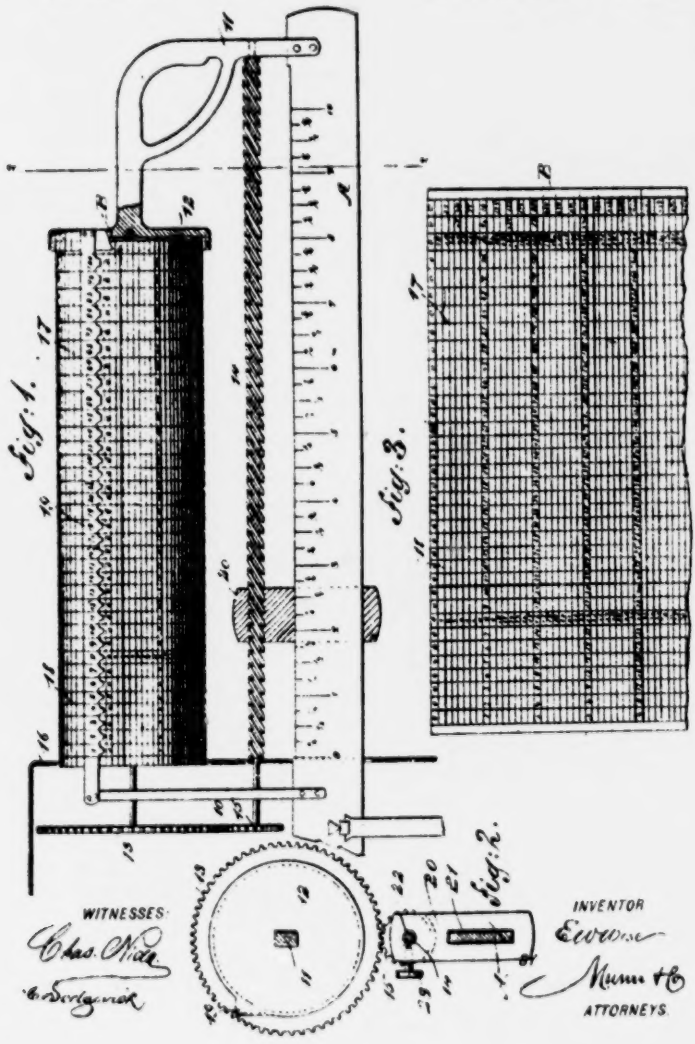
Witnesses:
D. D. DWIZ,
C. W. DUSTIN.

(No Model.) 817 2 Sheets—Sheet 1.

E. W. WISE.

COMPUTING ATTACHMENT FOR SCALE BEAMS.

No. 532,129. Patented Jan. 8, 1895.



WITNESSES:
Chas. Neide
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Munn & Co
ATTORNEYS.

1273

(No Model.) 819 2 Sheets—Sheet 2.

E. W. WISE.

COMPUTING ATTACHMENT FOR SCALE BEAMS.

No. 532,129. Patented Jan. 8, 1895

Fig. 4.

WITNESSES:
Chas Nichols
E. Bourgeois

INVENTOR
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BY Munn & Co
ATTORNEYS

1274

821

UNITED STATES PATENT OFFICE.

EDWARD W. WISE, OF LAS VEGAS, TERRITORY OF NEW MEXICO.

COMPUTING ATTACHMENT FOR SCALE-BEAMS.

SPECIFICATION forming part of Letters Patent No. 533,129, dated January 8, 1895.

Application filed March 5, 1894. Serial No. 502,461. (No model.)

To all whom it may concern:

Be it known that I, EDWARD W. WISE, of East Las Vegas, in the county of San Miguel and Territory of New Mexico, have invented a new and improved Computing Attachment for Scale-Beams, of which the following is a full, clear, and exact description.

My invention relates to a computing attachment for scale beams, and it has for its object to provide such an attachment which will be simple, durable and economic in its construction, and will indicate both the weight and the price, the beam being capable of use in the ordinary manner at any time.

A further object of the invention is to construct the attachment in such a way that the price will be indicated automatically and simultaneously with the operation of weighing, the usual movement of sliding the weight upon the beam causing the work of computation to be performed.

A further object of the invention is to produce an attachment of the above character which may be conveniently applied to any ordinary make of scales.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth and pointed out in the claim.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a front elevation of a scale beam having the attachment applied thereto, a portion of the attachment being in section. Fig. 2 is a vertical section through the attachment and the scale beam, said section being taken practically on the line 2—2 of Fig. 1. Fig. 3 is a plan view of a portion of the covering of the computing cylinder, illustrating the arrangement of calculated prices; and Fig. 4 is a view similar to Fig. 3, illustrating a slightly different arrangement of the table.

In carrying out the invention the scale beam A is one of ordinary make, and is provided near its ends with standards 10 and 11. The standard 10, which is attached to the beam near its pivot point, extends vertically upward therefrom, while the opposing standard 11, which is near the outer end of the beam, is more or less angular in construction, one member extending over the beam, and the horizontal member is provided with a flanged disk 12 at its inner end.

The computing cylinder B is journaled in the central portion of the disk 12, and likewise in the standard 10, the trunnion journaling the cylinder in the standard 10 extending beyond said standard, and it has attached to its outer extremity a gear 13.

A screw shaft 14, is located beneath the cylinder, being journaled in the two standards 10 and 11. The shaft extends beyond the standard 10, and is provided at its outer end with a pinion 15 meshing with the gear 13. If in practice it is found desirable a casing 16, may be made to inclose the gears, and inner end of the cylinder, while the disk 12 and its flange will effectually close and conceal the outer end of the cylinder B. This cylinder may be made of any approved material, light sheet metal being usually employed for the purpose; and the face of the cylinder is provided with circumferential lines 17, forming columns, and longitudinal lines 18, crossing the circumferential lines and producing spaces.

A rate indicator 19, is employed in connection with the cylinder, being made to face the front as shown best in Fig. 2. This rate indicator consists of a plate or bar of metal or other material, extending from the flange of the disk 12 longitudinally over the cylinder, preferably at a point between its top and bottom, the opposite end of the plate or bar being secured to the inner standard 10. The rate indicator is provided with columns corresponding to those upon the computing cylinder, and in the columns of the rate indicator the rate in cents or dollars per pound, per ounce, &c., is indicated. In the preferred construction of the rate indicator, pointers are formed at the bottom of each column thereon.

The sliding weight 20 used in connection with the scale beam is provided with the usual opening 21 for the passage of the said beam, and with an upper opening 22 the wall whereof is threaded to receive the screw shaft 14. Thus as the sliding weight is slid along the beam to obtain the proper weight, the shaft 14 is rotated and motion is communi-

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cated to the pinion 15 and to the computing cylinder through the medium of its gear 13.

I desire it to be distinctly understood that the columns and spaces may be produced directly upon the computing cylinder, or they may be produced upon paper, fabric, or other material secured upon the cylinder.

In Fig. 3 I have illustrated in plan view a portion of the face of the computing cylinder, and the figures in the spaces represent the computation of various weights of material at given prices, those shown upon the indicator, for example. In this particular scale I have made the circumference of the cylinder ten and one eighth inches. When the scales are at rest and the weight 20 is in the position indicated at "0" on the scale beam, the various pointers on the rate indicator will point to ciphers located in the columns of the computing cylinder. I have also made the scales to weigh just ten pounds, so I have just one inch of the circumference of the cylinder to represent one pound on the scale beam. By dividing one pound into two ounce spaces just one-eighth of an inch on the cylinder will be obtained for every two ounces in the ten pounds, so the prices are computed to two ounces. The gearing is so made that in moving the sliding weight any given distance on the scale beam the computing cylinder will revolve a corresponding distance at its circumference; that is, if the weight is moved to one pound the cylinder will turn exactly one pound, or in other words, the cylinder would turn eight spaces of two ounces each, or sixteen ounces. The rate per pound is shown on the rate indicator immediately above the column for which said rate was computed, so that when the price of anything is wanted, it is balanced on the scales in the usual manner, and by glancing at the rate for which the article is sold per pound, the amount will be found under the pointer for that column.

The table in Fig. 3 shows only a part of the cylinder unrolled enough to represent four pounds. The whole cylinder unrolled would show the same number of pounds that the beam indicates, which in this example would be ten. The computations should be carried to the nearest unit.

The scales with the attachment attached can be used as an automatic calculator. For example, if the clerk were asked for thirty-five cents' worth of an article that sells for fifty-five cents per pound, the sliding weight could be moved along the scale beam, the party manipulating the weight at the same time fixing his eye on the fifty-five cent column until the amount thirty-five cents comes to the point of the pointer of this column, and the weight would be exactly right. As another example, should it be required to weigh an article, say for instance, a piece of bacon, and it should weigh eight pounds and six ounces and was sold at nineteen cents per pound, the answer would be found at the pointer on the rate indicator, and this would save the time usually required for calculating the amount with a pencil.

In the event that the sliding weight should wear the thread upon the shaft 14, and thereby produce lost motion, said motion can be compensated by passing a set screw 23 through the weight to an engagement with the shaft, as illustrated in Fig. 2.

It will be readily understood that the usual movement in pushing the weight out upon the beam does all the work of computing, and that it requires very little extra exertion to manipulate the weight than on an ordinary scale without the calculating device. The beam and attachment thereto may be made for and used upon any of the ordinary makes of scales. The calculations may be made in multiples of five if desired, as for example, take the price per pound as twenty cents and the amount of space allowed for a pound one inch, then there would be one-fourth of an inch for each five cents' worth in a pound, &c.

The arrangement of the calculating face of the computing cylinder may be changed if desired, as for example, as shown in Fig. 4, in the first column, or that next to the body or frame of the scales. Instead of having prices indicated, an arrangement of weights may be shown, in which event the corresponding column upon the rate indicator will be designated "Weights," "Lbs.," "Ozs."

It is evident that the beam and calculator can be made to weigh and compute any number of pounds desired, and that changes in form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

The combination, with a scale beam, standards attached thereto, a computing cylinder journaled between the standards, the surface of which cylinder is arranged in columns bearing computed rates, and a rate indicator extending across the computing cylinder, independent thereof, and provided with columns corresponding to those on the cylinder, and registering therewith, each column on the rate indicator bearing a numeral or numerals indicating given rates, of a weight held to slide upon the scale beam, a screw shaft operated by said weight, and a gear connection between the screw shaft and the computing cylinder, as and for the purpose set forth.

EDWARD W. WISE.

Witnesses:
P. C. HOOSETT,
A. D. HIGGINS

1276

(No Model.) 823 3 Sheets—Sheet 1.

J. H. SWIHART.

COMPUTING SCALE.

No. 535,965. Patented Mar. 19, 1895.

Fig 1.

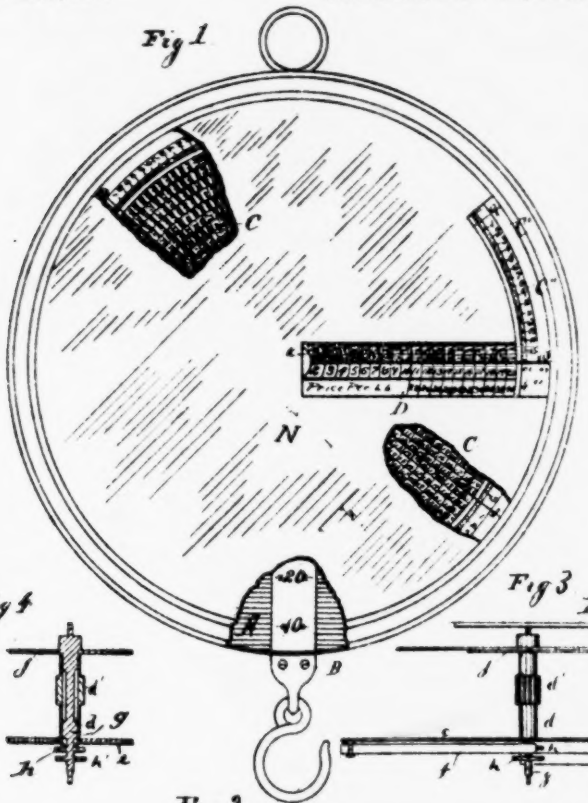

Fig 4.

Fig 3.

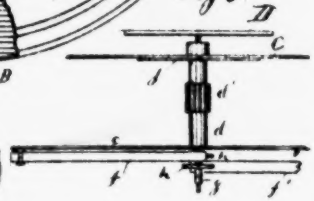

Fig 2.

WITNESSES:

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John H. Swihart

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R. J. McCarty

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1277

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(No Model.) 3 Sheets—Sheet 2.

J. H. SWIHART.

COMPUTING SCALE.

No. 535,965. Patented Mar. 19, 1895.

Fig 5.

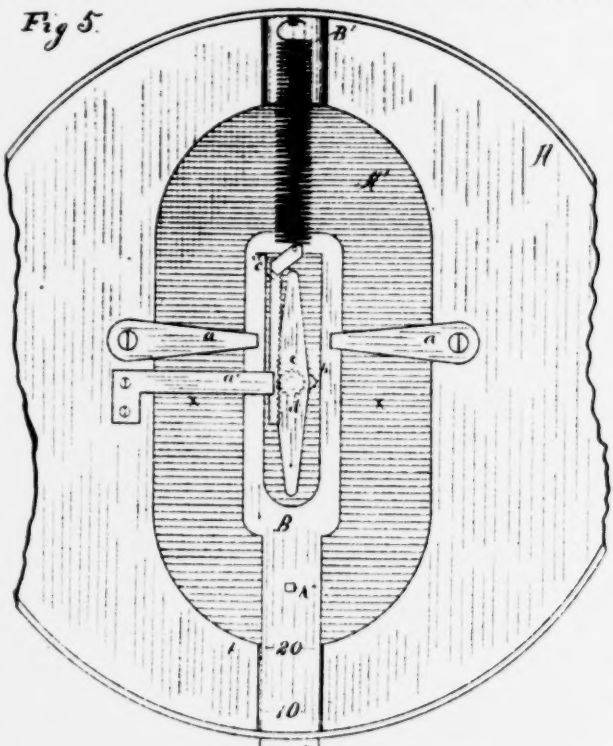
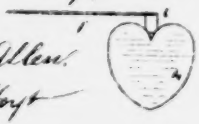


Fig 6.

Fig 7.



WITNESSES

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ATTORNEY

1278

(No Model.) 827 3 Sheets—Sheet 3

J. H. SWIHART.

COMPUTING SCALE.

No. 535,965. Patented Mar. 19, 1895.

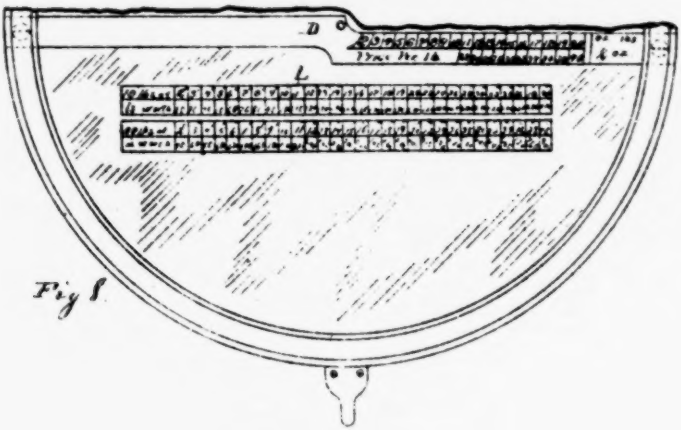
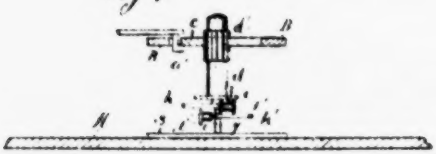


Fig 8

Fig 9



WITNESSES:

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Chas. Tusch Hoyt

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J. H. Swihart

BY

R. J. Whitney

ATTORNEY

1279

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UNITED STATES PATENT OFFICE.

JOHN HENRY SWIHART, OF DAYTON, OHIO.

COMPUTING-SCALE.

SPECIFICATION forming part of Letters Patent No. 535,905, dated March 19, 1895.

Application filed June 4, 1894. Serial No. 513,487. (No model.)

To all whom it may concern:

Be it known that I, JOHN HENRY SWIHART, of Dayton, county of Montgomery, State of Ohio, have invented a new and useful Improvement in Computing Scales; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to certain improvements in weighing scales, with a more specific reference to spring-balance scales of the computing type, or that class of scales that are provided with means for simultaneously indicating the value and weight of a given article or quantity of merchandise.

The object of the invention is to provide a spring-balance scale of the dial type, upon which the weight in units and fractional parts, of articles to be sold, and the money value of said unit or fractional parts, are arranged in a novel manner with a view to utilizing the entire space on the dial, which space, it is desirable, should be circumscribed or limited as much as possible.

A further and important object of my invention is to provide improved mechanism intervening between the computing dial, and the sliding bar from which the scale pan is suspended, through the agency of which said dial is not called upon to instantly respond to the undue momentum imparted to said sliding bar, due to the sudden placing of a load upon, or a sudden removal of a load from the scale pan, and to this extent said dial and adjunctive devices are protected from sudden vibrations that would tend to impair the efficiency of the scale; and further, the means provided for relieving the dial from these sudden vibrations or jerks due to the causes stated, will also perform the function of revolving said dial, independently of the momentum imparted by the sliding bar, to a proper position to indicate the weight and value of the article sold. To these ends I provide certain mechanism through the instrumentality of which the aforesaid independent movement may be imparted to the dial, and any lost motion between the sliding bar and the dial thereby avoided or compensated for.

With the above general statement of invention in mind, I will proceed to specify the various parts thereof, making a preliminary reference to the annexed drawings forming a supplement to the specification.

Figure 1, is a front elevation of a scale made in accordance with my invention. Portions of the concealing disk are broken away to reveal parts of the computing dial. Fig. 2 is an enlarged plan view of the heart-cams, and the spring-supporting bar; Fig. 3, a vertical elevation of the dial-actuating mechanism, removed from the main supporting plate; Fig. 4, a vertical section through the shaft and pinion sleeve; Fig. 5, an elevation of the main supporting plate, showing the inner face thereof, the sliding bar and dial-actuating mechanism; Fig. 6, an enlarged plan view of the heart-cams, springs and spring-supporting bar; Fig. 7, a detached, detail enlarged view of one of the heart-cams, showing the positions of the cam and pin when the dial is revolving with the pinion sleeve, or is at rest; Fig. 8, a front elevation of the scale, the upper portion broken away. The object of this view is to exhibit the supplemental table or scale by which the values of pounds in excess of ten pounds may be readily ascertained; ten pounds being the present limit of the dial. Fig. 9 is a section on the line *x*—*x* Fig. 5.

In the detailed description to follow letters of similar import will be found on corresponding parts.

Referring to Fig. 5 on Sheet 2, A indicates a metallic supporting plate, concaved and circular in form and having an oblong recess A' in its vertical center to provide space for the location of the dial-actuating mechanism.

B designates the sliding bar vertically movable in guides (*a*)—(*a*) attached to plate A, and in slot (*b*) formed in said plate. The lower end of said bar is provided with an eye to which may be linked, a hook to support the scale pan, not shown in the drawings.

B' designates a spring attached to the plate A and to the sliding bar, against the tension of which the sliding bar is drawn when a load is placed on the scale pan. The sliding bar

is provided with an opening in its upper portion to permit of the free movement of said bar, and the parts adjacent thereto.

(*e*) designates a rack bar pivoted at one end to the sliding bar; (*d*), a sleeve with a pinion (*d'*) formed thereon that meshes with said rack bar, and (*a'*) designates an angular stop bar attached to the plate A, which limits the movement of the rack bar from the pinion. To the inner end of the pinion sleeve (*d*) there is rigidly attached a bar (*e*).

(*f*) and (*f''*) designate springs having their outer ends attached to lugs (*f'''*) projecting from the ends of said bar. Upon the inner ends of these springs there are attached pins (*i*) and (*i'*) having their outer ends rounded substantially as shown in Fig. 7.

From the foregoing description it will be noted the sleeve (*d*), pinion (*d'*), bar (*e*) and springs (*f*) and (*f''*) are in rigid attachment, therefore, move together when operated.

(*g*) denotes a shaft providing a bearing for the pinion sleeve, and the portion inclosed by said sleeve is provided with a varying diameter as shown in Fig. 4, so that a small part only, of said shaft comes in frictional contact with the sleeve. Therefore, the least possible resistance is offered these parts.

(*h*) and (*h'*) designate heart-cams having a rigid attachment with the shaft (*g*). The positions in which these cams are mounted are clearly shown in the various views, wherein it will be noted one is slightly above the other and both are adjacent to the spring-supporting bar (*e*). The pins (*i*) and (*i'*) normally press against the peripheries of the cams under the tension of said springs.

(*j*) designates a plate rigidly attached to the outer end of the shaft (*g*), upon which the value and weight indicating dial C is mounted subject to revolution.

It will be noted from the foregoing, the shaft (*g*), heart-cams (*h*) and (*h'*) and the dial C are in rigid attachment, therefore, are subject to a common movement independently of the pinion sleeve and the parts movable therewith. Bearings for the shaft (*g*) are provided, respectively, in the plate (*s*), see Fig. 9, attached to the supporting plate A, and transverse bar D. See Figs. 3 and 8. The bar D is screwed to the rim of the plate A, in front of the dial, and upon it, as is indicated, numerals designating the prices per pound of the various articles.

Referring to Fig. 5, it will be seen that a load placed upon the scale pan will have the effect of moving the sliding bar B, carrying the rack bar therewith, which, meshing with the pinion, will rotate the latter. This draft on the sliding bar, when steady and free from jerks or sudden vibrations, will rotate in unison, the shaft and pinion sleeve with their respective attachments. This uniform movement is due to the tension of the springs (*f*) and (*f''*) being greater than the combined weight of the shaft (*g*) and the parts attached thereto, to wit, the dial C and the heart-cams. The pins (*i*) and (*i'*) being normally in the notched or inwardly curved parts of said cams, the shaft is compelled to rotate with the pinion sleeve. Should a quick momentum, however, be imparted to the sliding bar, it will move the pinion sleeve and spring-supporting bar (*e*) alone, for an instant, thus withdrawing the pins from the notches in the cams, causing them as the bar (*e*) rotates, to move to a greater or less extent, on the inclined peripheries of said cams. As the momentum of the sliding bar recovers from the sudden impetus, or stops under the weight of the load, the pressure of the springs (*f*) and (*f''*) will snap the cams to their normal position, shown in Fig. 6, and bring the dial in a position wherein the figures on said dial denoting the weight and value will be in alignment with those on the price per pound bar D. It will be observed, when the movable parts are under a gradual and systematic movement, the strain and the friction due to the weight of all the parts, are confined to the pinion and rack, but at a time when these parts should be relieved of as much strain as possible, the weight of the dial is instantly taken off the pinion sleeve. The cams and springs acting somewhat on a plan analogous to that of a governor, regulate the movement of the dial with reference to the motion imparted to the pinion sleeve.

As illustrated in Fig. 1, the scale has a capacity for computing the money value of goods at from two to forty cents per pound up to ten pounds.

Referring to dial C, Fig. 1, upon which the computations are shown, the two circumferential columns C' and C'' bear numerals indicating pounds and ounces. Inclosed by these two columns are a series of concentric circles subdivided into uniform spaces, radiating from the inner circle (*k*). The graduated numbers in these radial spaces represent the value in money of the article weighed, and are brought in alignment with the numerals representing the price per pound on the bar D, by the load.

To illustrate the operation attention is called to Fig. 1, where it will be noted figure 10 in the unit column C' is on a horizontal plane with the upper edge of the bar D, upon which the prices per pound are indicated. To ascertain the value of ten pounds of any article selling at, say, twenty cents per pound, the figures on the dial immediately above "20" on the bar D, and in alignment therewith, will give the total value, to wit: two dollars.

In order to increase the capacity of the scale and adapt it to weigh and compute up to, say thirty pounds, I place on the sliding bar B, figures 10 and 20 denoting one and two revolutions of the dial; the lug K projecting from said bar and limiting the downward movement thereof denoting the third revolution of said dial and indicating that thirty pounds have been weighed, "30" appearing on the

bar B and "10" on the dial. A supplemental price table or scale L is conveniently placed on the lower face of the scale, see Fig. 8, containing numerals indicating prices per pounds and values at ten and twenty pound quantities, the weights between ten and twenty pounds being indicated on the dial. When this supplemental scale is used the weight will be indicated on the sliding bar B; and assuming it to be "20" and the value per pound "20," (twenty multiplied by twenty equals four hundred,) this total will be found in the lower column in scale L directly below "20" in the adjacent column.

As shown in Fig. 1, I prefer to conceal the computing dial with a disk N having a suitable sight-opening through which the figures may be read, and over this disk a glass face or crystal may be placed to protect the mechanism from dust. Deeming the mechanism through which the dial is relieved of any abrupt movement or strain of the sliding bar, and by which said dial is compelled to respond to the movement of said bar thereby avoiding any lost motion, a very essential part of my invention, I do not desire to limit myself to the use of two cams, as a greater number of these devices may be used. I find in practice, however, that the number and arrangement of said cams herein shown and described, are preferable.

The mechanism for operating the dial may be equally effective for revolving a computing cylinder, by changing the location of the cams and springs. Therefore, I do not wish to restrict myself to its use in connection with a dial.

Having fully described my invention, I claim—

1. The combination of a spring-controlled sliding bar, a rack bar pivoted thereto; a pinion sleeve movable by said rack bar, a transverse bar fixed to said pinion sleeve, springs provided with pins, mounted on said bar; a shaft inclosed by said pinion sleeve; and cams rigidly mounted on said shaft, against which the pins on the springs normally rest, whereby means are provided for effecting independent movements of said pinion sleeve, and shaft.

2. The combination of a value and weight-indicating dial, a price per pound scale adjacent thereto, a plurality of cams and a shaft to which said cams and dial are rigidly attached, a pinion sleeve a transverse bar fixed to said pinion sleeve; springs carried by said bar having pins that normally rest on the peripheries of said cams, whereby the shaft and dial may move in unison with the pinion sleeve or independently thereof.

3. The combination with a sliding bar, and a rack; of a shaft with cams and a dial rigidly attached thereto; a pinion sleeve with springs mounted thereon, said springs provided with pins that normally press against the peripheries of said cams, whereby said shaft and pinion sleeve may be moved in unison, or independently of each other, substantially as described.

4. In a computing scale, the combination with a value and weight indicating dial, and a price per pound scale adjacent thereto, of a plurality of cams, a shaft upon which cams and the dial are rigidly mounted, a pinion sleeve inclosing said shaft, to which a spring-supporting bar is rigidly attached, springs mounted on said bar carrying pins adapted to normally press against the peripheries of the cams, and means for actuating said pinion sleeve whereby the shaft and dial, and the pinion sleeve may move simultaneously or independently, substantially as described.

5. The combination with a revoluble shaft, and a pinion sleeve loosely inclosing said shaft; of an indicating dial, and cams, rigidly mounted on said shaft; springs carried by said pinion sleeve having pins that normally bear against the peripheries of said cams, and means for transmitting motion to said pinion sleeve to rotate the dial, through the medium of said cams and springs which also return said dial to its normal position, substantially as specified.

6. The combination with a sliding bar, a rack, and a revolving dial upon which are indicated in circumferential columns, units and fractions of weight, and in radial spaces graduated numbers indicating the values of said weights, of a shaft to which said dial is fixed, cams (*h*) and (*h'*), also fixed to said shaft, a pinion sleeve (*d*) carrying a bar (*e*), springs (*f*) and (*f'*) mounted on said bar and provided with pins that normally rest on the peripheries of said cams, whereby the dial may be moved simultaneously with the sliding bar, or released from the movement of said sliding bar, substantially as described.

In testimony whereof I have hereunto set my hand this 28th day of May, 1894.

JOHN HENRY SWIHART.

Witnesses:
R. J. McCARTY,
CHAS. A. HOYT.

(No Model.)

1282
833

F. L. STEWART.

WEIGHING SCALE.

No. 538,981. Patented May 7, 1895.

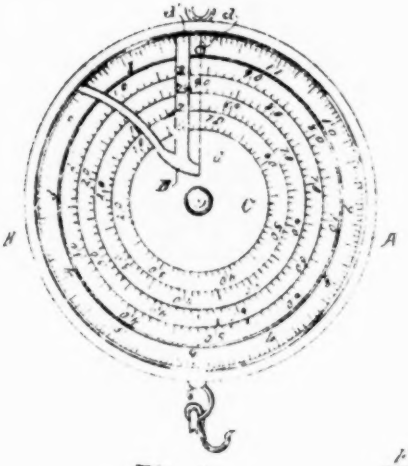

Fig. 1.

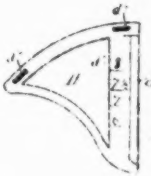

Fig. 2.

Fig. 3.

Witnesses:
E. E. Shafer
C. D. Sharman

Inventor
Frank L. Stewart
By Jehiel J. Libby
Attorney

1383

835
UNITED STATES PATENT OFFICE.

FRANK L. STEWART, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR OF ONE-HALF TO WILLIAM T. LAMOREAUX AND ALLEN P. COLLAR, OF SAME PLACE.

WEIGHING-SCALE.

SPECIFICATION forming part of Letters Patent No. 538,981, dated May 7, 1895.

Application filed October 24, 1894. Serial No. 526,894. (No model.)

To all whom it may concern:

Be it known that I, FRANK L. STEWART, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Weighing-Scales, of which the following is a specification.

My invention relates to improvements in scales for use in weighing meat, and other small articles, and its objects are, first, to provide a scale having a weighing dial and computing dial on the same plate; second, to provide for adjusting the hand to correspond with the units line on the dial or the variation of the spring when used on spring scales, and, third, to dispense with the use of an extra revolving hand in computing weighing scales. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of my frame, dial, and hand. Fig. 2 is an elevation of the hand detached from the scales; and Fig. 3 is a vertical cross-section of the scale frame, showing the manner of attaching the dial.

Similar letters refer to similar parts throughout the several views.

My dial is supported upon, and designed to turn with the shaft E as it is carried around by the weight of the article being weighed, and is provided with an outer circle of figures B denoting the number of pounds and ounces to be weighed as 1 2 3 4 5, &c., and a series of inner, concentric circles C that are divided into decimals and figured to compute the value, in dimes and cents, of any article weighed, at any given price per pound, as indicated by the figures 10 20 30 40 50, &c., and their subdivisions. Shown in Fig. 1. The price per pound is stamped upon a band D having a main portion *d'* upon which is stamped or printed, the price, as 5 6 7 8, &c., in position to correspond with the corresponding circle on the dial. In lieu of a pointer to mark the position at which the weighing and computing are fixed I form a fine line *d* like the stretching of a fine wire upon the hand a short distance from the edge of the body *d'*, as shown in Fig. 1, in position to stand exactly over the weighing and computing figures or marks when the scales have settled to the weight of the article upon which weight and computation are desired. This hand is secured to the rim A, or the case F of the scales so that it is a fixture thereto, but may be adjusted to stand at the exact position desired, by means of the slots *d''* upon the screws that secure it, in the usual way. With this form of hand I am enabled to leave the entire face of the dial open, so that I am enabled to mark my computing figures in tens instead of in units and thus save a great deal of trouble, expense and confusion in making the dial and also in computing prices; and I have the advantage of having but one position to look at to ascertain both the weight and the price of the article being weighed. With this dial I can compute in whole numbers or fractions when the dial is properly arranged, as I have indicated at 6½ on the hand, and the number of different prices that may be computed upon is limited, only, by the size of the dial and the number, and space of the concentric computing rings upon the face of the dial and the corresponding length of the hand and the index figures thereon.

A glance at Fig. 3 will show that the dial is supported upon the center shaft of the scales, and is otherwise entirely detached from the frame of the scales so that its revolving motion is entirely free and unimpeded except by the tension of the actuating spring G, so that while the entire dial revolves, it is perfectly balanced, and its motion is as free and certain as is the motion of a revolving hand.

Having thus described my invention, what I claim as new is—

The combination in a weighing scale, of a revoluble dial having a series of concentric rings, the outer of said rings divided to compute pounds and ounces, and the balance divided and figured to compute the aggregate cost of the article weighed, at any given price per pound, and a hand having price marks to correspond with each of the several cost marks on the dial, said hand integral with

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and supported by a segmental body having slots by means of which it is adjustably secured to the frame that supports the revoluble dial, a brace connecting said hand and adjustable body, and a fine reading line or wire attached to the hand, and supported to radiate from the center to the periphery and directly over the units line of the dial when it is in its normal position, substantially as and for the purpose set forth.

Signed at Grand Rapids, Michigan, this 12th day of October, 1891.

FRANK L. STEWART.

In presence of—
GEO. E. SHAFER,
ITHIEL J. CILLEY.

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(No Model) 6 Sheets—Sheet 1

C. L. BUCKINGHAM.

PRINTING TELEGRAPH.

No. 544,235. Patented Aug. 13, 1895.

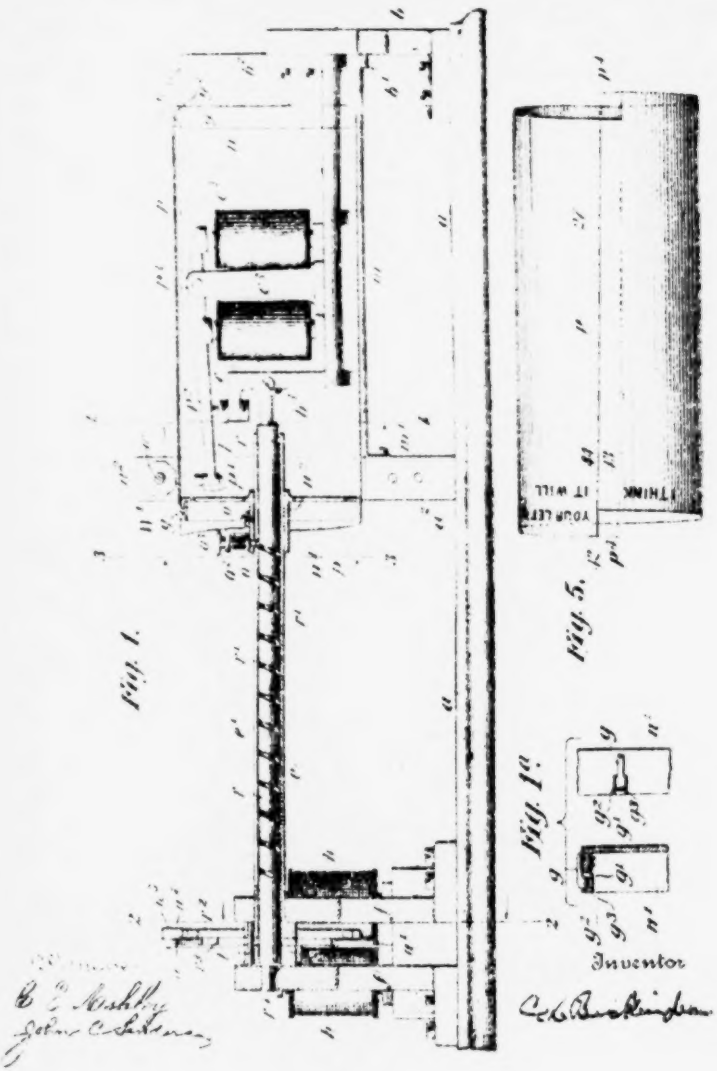


Fig. 1.

Fig. 5.

Fig. 1a.

Witnesses

Inventor

1286

(No Model.) 839 6 Sheets—Sheet 2.

C. L. BUCKINGHAM.

PRINTING TELEGRAPH.

No. 544,345. Patented Aug. 13, 1895.

Fig. 2.

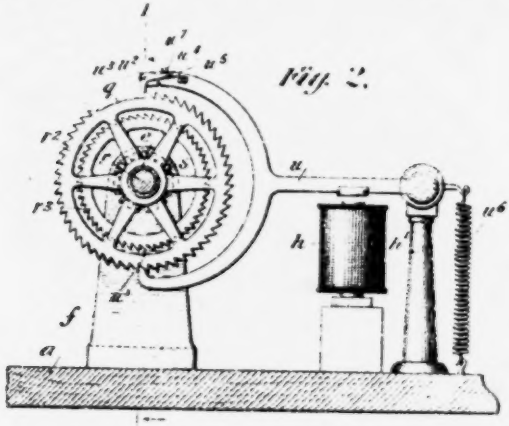


Fig. 3.

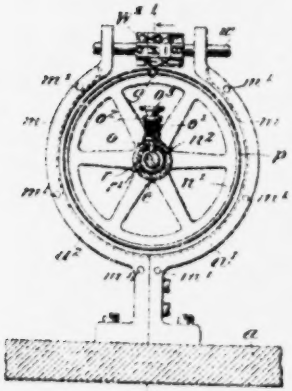
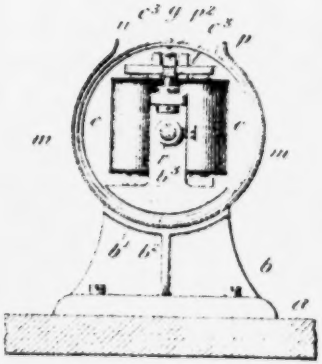


Fig. 4.



Witnesses

C. E. Mosby

John. C. Adams

119

Inventor

C. L. Buckingham

1287

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(No Model.) 6 Sheets—Sheet 3.

C. L. BUCKINGHAM.

PRINTING TELEGRAPH.

No. 544,345. Patented Aug. 13, 1895.

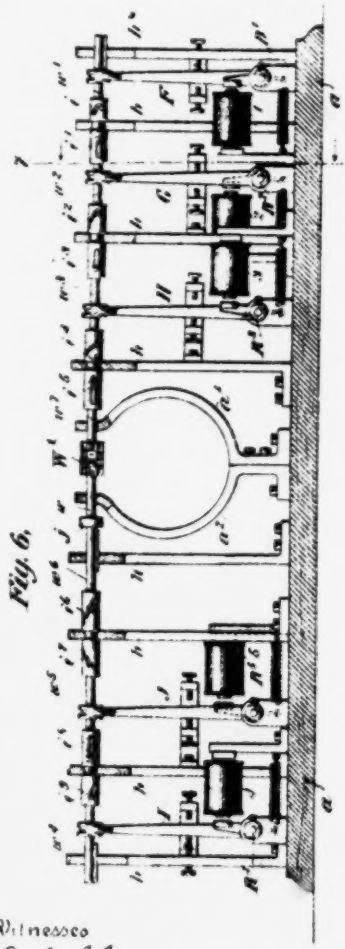

Fig. 6.

Fig. 6a.

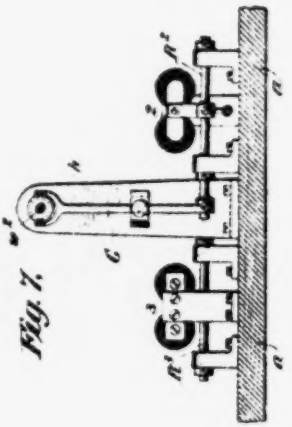

Fig. 7.

Witnesses

C. E. Ashley

John C. Sanders

Inventor

C. L. Buckingham

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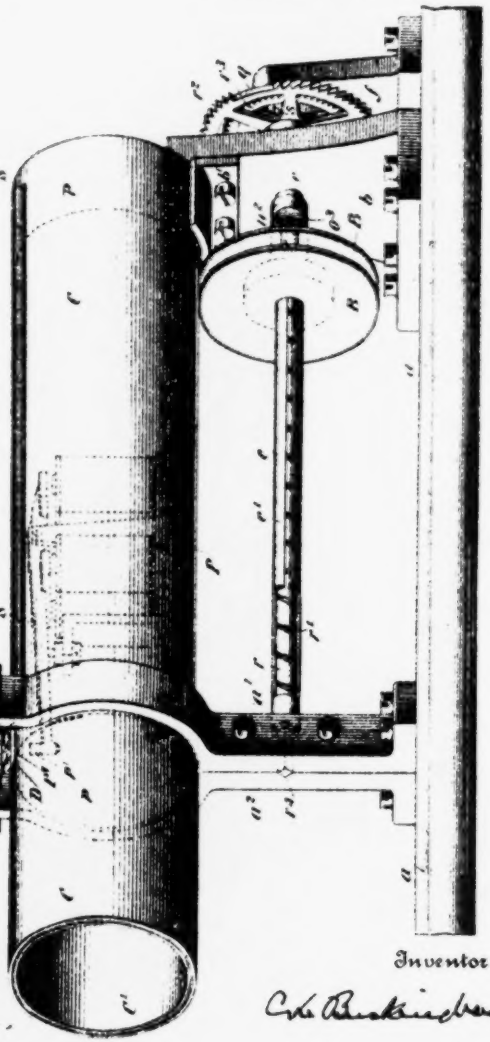
(No Model.) 6 Sheets—Sheet 4.

C. L. BUCKINGHAM.

PRINTING TELEGRAPH.

No. 544,345. Patented Aug. 13, 1895.

Fig. 3.



Witnesses
C. E. Ashley
John C. Sanders

Inventor
C. L. Buckingham

1289

(No Model.) 845 6 Sheets—Sheet 5.

C. L. BUCKINGHAM.

PRINTING TELEGRAPH.

No. 544,345. Patented Aug. 13, 1895.

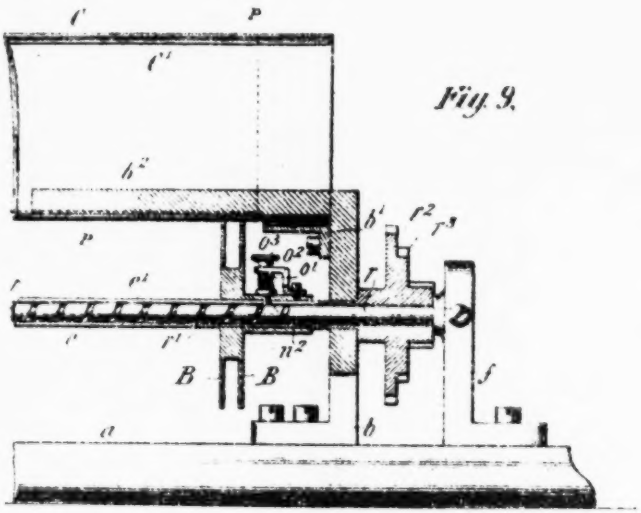


Fig. 9.

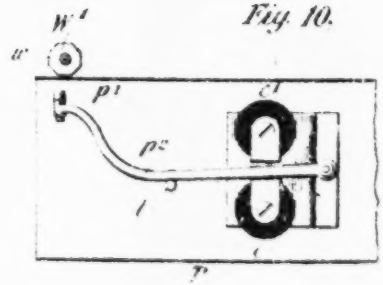


Fig. 10.

Witnesses:
H. E. Ashley
John C. Sanders

Inventor:
C. L. Buckingham

1290

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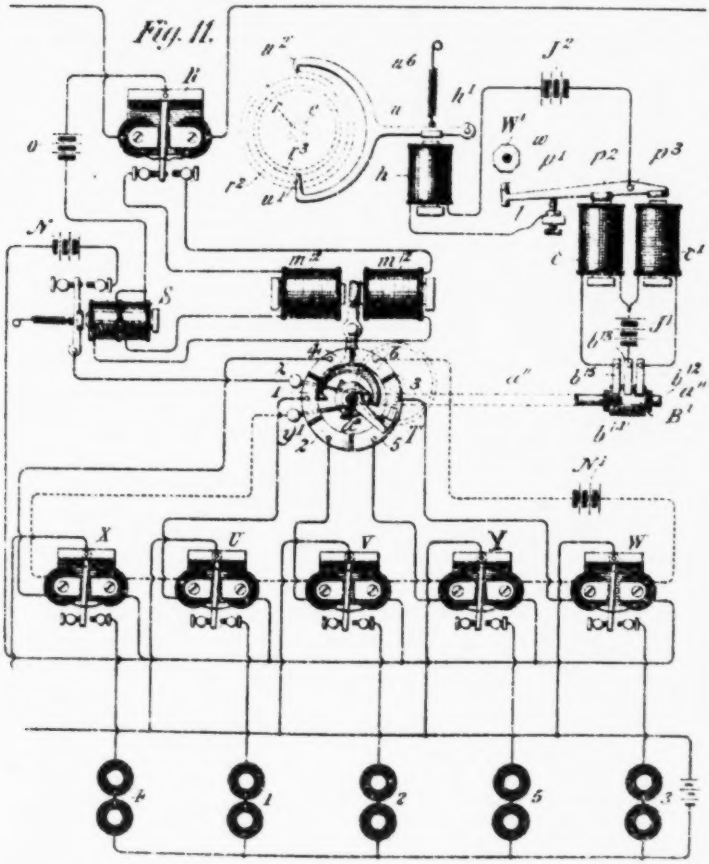
(No Model.) 6 Sheets—Sheet 6

C. L. BUCKINGHAM.

PRINTING TELEGRAPH.

No. 544,345. Patented Aug. 13, 1895.

Fig. 11.



Witnesses
C. E. Ashley
John C. Sanders

Inventor
C. L. Buckingham

1291

849

UNITED STATES PATENT OFFICE.

CHARLES L. BUCKINGHAM, OF NEW YORK, N. Y.

PRINTING-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 544,345, dated August 13, 1895.

Application filed April 16, 1894. Serial No. 507,673. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. BUCKINGHAM, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented a certain new and useful Printing-Telegraph, of which the following is a specification.

My invention relates to type-printing machines; and is designed more particularly to adapt said machines for printing typographical characters in page form at high speed upon sheets of paper.

My improved printer, while adapted to the purposes of the ordinary type-writer, is especially useful as a telegraph-receiver, inasmuch as it is capable of reproducing messages in page form over a telegraph-wire at a rate equal to that of automatic transmission by the Wheatstone method. Others have devised telegraph-receivers for printing messages in page form; but in all such machines their speed of operation has been so far limited by complicated and heavy mechanism, which they employed to feed a sheet of paper to print letter by letter and to return the apparatus at the termination of each line, that they could only be used to receive transmissions at the rate of one-fourth or one-eighth of the speed required by my system. For example, in one class of page-printers a heavy carrier for moving the paper under the type-wheel step by step to the end of a line and to then return it to an initial point—a distance equal to the width of the paper sheet—had been used, and in another the type wheel was moved in like manner across the paper against the action of a strong spring while the paper remained in a fixed position. The difficulty of moving a paper-carrier or the type-wheel itself backward at the end of each line a distance equal to the width of a wide sheet of paper is obvious.

In carrying out my present invention the paper may be formed into a tube, the ends of which are placed over and fastened upon suitable supports, as a hook, at each end, the type-wheel being arranged without the paper-cylinder, while the press mechanism is situated within.

The edges of the sheet may be lapped or not, for in either case one line may be terminated as a new one is begun, thereby obviating a long return movement. If the edges of the paper sheet are lapped one over the other a short distance—say, one-quarter or one-half an inch—the tube, as the lap comes between the type wheel and press, is given a movement of rotation in the direction of the letter and word space feed sufficiently long to leave a blank space of half an inch or more, thereby affording a suitable margin at both edges of the page; and the same result is accomplished where the edges are not lapped or brought together at all; but in the latter case the long step of rotation should be greater to provide ample margins.

The tube may be formed by fastening the sheet around hoops at each end, motion of rotation for the letters of a line and a movement along its axis for succeeding lines being communicated from a suitable motor to a shaft to which one of the hoops is rigidly fixed; or, preferably, the paper sheet may be itself fed upon the smooth stationary surface of a cylinder, thus leaving the paper entirely unincumbered by heavy apparatus, or any apparatus at all, that is directly connected with the paper, which may be moved as an incident of the step-by-step operation of the sheet. In this case the two movements of the sheet would be imparted by frictional or other feeding mechanism engaging the paper itself.

A tubular form is the one which the paper must naturally assumes in the operation of feeding a sheet for the beginning of a new line where the old one is terminated; but instead of carrying the paper in the curve of a circle it could, as already indicated, be guided between the type-wheel and platen around small rollers, as an endless belt having two parallel strands.

In order to cover the vertical space on the printed page between lines, suitable provision of course must be made for feeding the blank at right angles to the letter or word space feed, or for correspondingly moving the printing devices. It is preferable to move the blank for this purpose. This feed in my invention may be made either at the end of the line or may be distributed throughout the letter and word feed of each line. In the latter case I provide for the vertical space-feed of the page by printing each line on a spiral the pitch or angle of which for each whole

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revolution of the band or tube is equal to the vertical space between lines, so that on the completion of one line the printing devices will be in about the proper position to print the beginning of the next line. This feed is readily provided by means of a screw device connected with the rotating carrier or carriers or other device which feeds the paper or blank by letter and word, thereby giving the blank a continuous movement of translation axially during its rotation. In order, however, that the lines may be straight on the printed page, the blank may be correspondingly skewed or twisted to compensate for the spiral feed. This would be done by setting or displacing the edge of the blank on which the lines end downwardly a distance equal to the pitch of the spiral, so that in effect the bottom and top edges of the sheet would each describe a spiral corresponding to the spiral feed. As the effect of doing this with a sheet of paper formed into a tube is also to cause the side edge to describe a long spiral longitudinally of the tube, provision may be made for causing the feed mechanism to lose slightly to compensate for the slight difference in circumferential position upon the tubular blank at which the printing of each line is begun, so that the edge-space may be uniform down the whole page.

The paper tube is given a circumferential step-by-step movement by means of any suitable apparatus. Preferably I use an escapement for this purpose, so designed that the paper shall be fed short distances from one position to the next in printing a line, while there are means for giving the paper a long-step action or, more generally, a modified movement to carry the seam of the tube quickly past the type-wheel.

Another part of my invention relates to means for controlling the paper-feed when escapement mechanism is employed. The object of this part of the invention is to permit the use of a positive driving power controlled by an escapement, but in such manner that the paper shall feed when the escapement moves in one direction only. When an electromagnet is employed to control this mechanism, a feed takes place only when the armature moves in obedience to the pull of the magnet, no movement taking place in the paper-feed when the armature is retracted, or vice versa. The essential feature of this part of the invention consists of an anchor-escapement, which is always engaged with the escape-wheel by one or the other of its pallets, but has one of its pallets constructed to yield or give a fixed or determinate amount.

My invention relates further to improved or simplified means for giving a type-wheel having two or more rings of type a movement axially to bring different rings into position for printing, and constitutes an improvement upon the means described in my prior patent, No. 487,981, dated December 13, 1892.

My invention consists further in details of construction and combinations of parts more particularly specified in the claims.

In the accompanying drawings, Figure 1 is a side elevation and partial section on the line 1 1, Figs. 2 and 3, of a form of apparatus embodying my invention. Fig. 1ª shows, in side and plan view, the paper-clips used in the form of apparatus illustrated in Fig. 1. Fig. 2 is an end elevation showing the escapement devices for the paper-feed and taken on the sectional line 2 2 of Fig. 1. Fig. 3 is an end elevation taken on the cross sectional line 3 3, of Fig. 1, the devices for adjusting the type-wheel being omitted. Fig. 4 is a cross-section on the line 4 4, Fig. 1. Fig. 5 shows the form which the blank sheet takes when it is given the tubular form and is at the same time twisted so that its upper and lower edges will describe a spiral around its axis of rotation. Fig. 6 shows in general side elevation the means for giving the wheel a movement of rotation, as well as an axial movement when it has several rings of type, as in my prior patent before referred to. Fig. 6ª is a longitudinal section of the parts at the point of connection of the type-wheel shaft with the non-rotating extension thereof. Fig. 7 shows in end view two of the adjusting or impelling magnets which operate on devices and followers of Fig. 6. Fig. 8 shows in perspective a modification of the invention wherein provision is made for feeding the paper tube directly. Fig. 9 shows in side elevation and partial section a portion of the apparatus, Fig. 8. Fig. 10 shows a modification of the press-magnet. Fig. 11 is a general diagram showing the electric connections of the apparatus.

p indicates the tube or band of paper or other material constituting the blank upon which matter is printed character by character. The edges of the blank constituting the side edges of the printed sheet are connected together in any suitable way—as, for instance, by lapping them and clamping them down upon suitable rotating rings or carriers, or by cementing said edges together and allowing the paper to rotate by itself on a suitable support by the action of a proper frictional feeding device, as will be described further on.

The means for connecting the edge of the paper so that it may be fed continuously as a band or tube from the end of one line to the beginning of the next may be varied indefinitely without departing from my invention.

In Figs. 1, 2, and 3 I have shown a construction wherein the edges of the paper blank are kept in proper relative position by the use of proper spring clips. (Indicated at *g*.) The paper is here shown as applied around carrier hoops or rings *r r'*, upon the edges of which the spring clips *g* are mounted.

g' are springs applied to the heels of the clips to hold them in clamping position. *g²* are pivots on *r r'* on the clips are mounted

and g' slots in the edges of the hoops n n', where the clips are supported.

m is an exterior tube or guideway surrounding the paper tube and hoops and adapted to help hold the paper in proper cylindrical form, as well as to guide the paper both during the feed movement and in the operation of applying a fresh sheet of paper to the hoops. The tube m, as seen in the end view, is open at its top to allow space for getting at the edges of the paper in fastening it upon the hoops. The paper is rotated continuously in the same direction around the axis of the hoops between the type-wheel W and press-pad p' by suitable power applied to one of the hoops or carriers. This is readily accomplished by mounting one of the hoops n' as a wheel, the hub of which is indicated at n^2, and which serves the purpose of a paper-feed wheel, since through it the paper tube is rotated continuously in the same direction, both for the letter and word spaces and for beginning a new line, and is moved axially for the purpose of covering the space between the lines.

The exterior tube m is supported at one end by means of screws m', passing through a flange in the end of the tube and securing it to standard a^2, and at the other end is supported upon a lug b', projecting from the standard b. Press-pad p' is supported upon the end of the armature lever for the press-magnet, the latter being in turn supported within the paper tube by means of a bracket b^3. The base supporting these standards is indicated at a.

The feed of the paper both in the direction of rotation step by step around its axis and in a longitudinal direction in the direction of its axis is provided for by giving the feed-wheel, whose hub is indicated at n^2, a movement of rotation around its axis and a movement of translation bodily in a direction parallel to its axis. The latter movement may be a continuous movement distributed through the whole circle of rotation, if desired, and the mechanism shown in Fig. 1 is adapted to produce such distributed movement, thereby causing a line to be printed around the circumference of the paper tube or cylinder p in a spiral line.

As before intimated, in order that the line may appear straight on the blank after it is removed from the apparatus, a twist should be given to the blank in the machine, as indicated in Fig. 5, where the top of the blank or printed page is at the left of the figure, assuming the rotation to be clockwise, looking at the tube from the left-hand end, Fig. 1, and the movement of the tube to be axially from right to left.

As will be seen on inspection of Fig. 5, the upper edge of the blank itself describes a spiral the pitch of which is approximately equal to the vertical space on the printed page between the lines. To produce this movement of rotation and of translation axially in the feed-wheel, the following devices may be employed: r is a fixed screw-shaft mounted at one end in a bracket b^3, within the paper tube, and at the other end fixed at r^4 in one of two standards f f'. Rotating on the screw-shaft r is a hollow shaft or sleeve e, on which the hub n^2 may slide longitudinally. The shaft e is rotated step by step as the feed of the paper tube circumferentially for letter and word spaces may require, being controlled in such rotation by proper escapement devices of any suitable character. The shaft e has a longitudinal slot e' in it through which passes a pin o, mounted upon the hub n^2, and engaging the spiral r' in the shaft r. By this means the hub n^2 works as a nut upon the screw-shaft, the effect being that as the shaft e rotates, thereby carrying the hub and feed-wheel around, the latter, through engagement of pin o, with the spiral in the screw-shaft, is caused to move accordingly in an axial line over the shaft, thus carrying the paper tube along in an axial direction under the type-wheel and platen. The sleeve e is itself supported in a bearing on the standard f and on the shaft r. s is any gear-wheel by which suitable power may be applied to rotate the sleeve e, the said wheel s being secured to the shaft e in any desired manner. By preference the wheel s and the escapement wheel or wheels r^3 r^5, controlling the step-by-step movement of the shaft, are keyed together thereon as indicated in the sectional view, Fig. 1.

By rotation of the feed-wheel the tube is drawn along axially until the end of the screw-shaft is reached or until the bottom of the page is reached, after which the printed paper tube may be removed by unfastening the clips.

In order to permit the devices to be returned to normal position, the pin o is mounted in a suitable bracket o^3 on the hub n^2 and is held down by a spring o' in engagement with the screw-shaft. A knob o^2 on the end of the pin o permits it to be raised out of engagement with the screw-shaft, so that the wheel may be slid back to the original position shown in the drawings, Fig. 1.

In order to permit the clips g to readily engage with the paper, the corners of the paper should be cut out as indicated by the dotted lines p^4, Fig. 5.

It will be readily seen that if the paper were wrapped as a plain cylinder, so that its top and bottom edges should be in planes at right angles to the axis of the tube, then the spiral feed of the paper under the type-wheel would cause the lines to appear inclined downwardly from the right to the left of the page; but by giving a twist to the paper, as shown in Fig. 5, so that the upper edge will describe a spiral on the cylinder equivalent to the pitch of the feed-screw, the line will across the whole sheet be at the same distance from the top edge, but nevertheless the end of the line will practically coincide with the beginning of the next line. This can be seen from the diagram, Fig. 5, where the beginning of a line of printing is indicated at 42 and the end

of the same line at 43, which, as will be seen, practically coincides with the beginning 44 of the next line.

As will be seen, the side edge 27 of the blank is inclined, so that at the beginning of each line, if the margin is to be straight or of the same width, the paper tube will require to make a little less or more than a whole revolution for each line printed, according to the direction of the spiral formed by the edge of the paper with reference to the direction of feed.

When the paper is fed by a mechanism the controlling-wheel of which is adjusted to have an amplified step or feed movement periodically or once in each revolution for the purpose of feeding across the margin of the page, and the paper blank is applied so that its edge describes a spiral on the cylinder, I so adjust or construct the feed mechanism that it shall rotate the paper tube a little more or less than a complete rotation for one rotation of the feed-controlling wheel, in order that the beginning of the lines may also describe a spiral parallel to the edge of the paper, thus giving the uniform margin.

When the feed mechanism is constructed with reference to the spiral or inclined line 27, it should be made to reach the point of enlarged or amplified feed-space at a little less than one whole revolution of the paper-cylinder.

In the modification indicated in Fig. 8, which shows the preferred form of my invention, the paper alone is made to rotate and to move longitudinally, being unattached to any hooks, rings, or carriers moving with it, as does the hook *n* or *n'* of Fig. 1.

C' is a smooth stationary cylinder supported within an exterior cylinder C, which is slotted at S and P, said cylinders being slotted at P' and D for the operation of the press-pad upon the type-wheel. This outer cylinder C, which, however, may be and is omitted when the edges of the paper are gummed together to form the tube, is supported by a bracket *b'*, and the interior cylinder is supported by the same bracket which carries the printing-magnet and press-pad or by other means.

In forming the tube by gumming, the paper blank is provided at its side edge with a suitable cement adapted to be softened by heat, the sheet having been applied around the inner cylinder. The outer cylinder may in this case be used, although it is of little utility. If used, the paper will be inserted by slipping its edge through slot S, the outer cylinder then serving to guide it and cause it to describe a circle around the outer circumference of C'. When the edges are brought together under the slot S, they may be gummed at two or more points at the edges and fastened by the application of a hot iron; but where an outer cylinder C is used the edges of the sheet need not be fastened at more than one point, nor, in fact, is it absolutely necessary that they be fastened together at all. It is, however, preferable to gum the edges at two or more points, even when an outer cylinder C is used.

When the outer cylinder C is employed, the paper tube formed on the cylinder C' should have its edges lapped one upon the other in such way that the forward or advancing edge next the beginning of the lines shall be beneath the opposite edge, thereby avoiding the possibility of the edges of the paper catching against the edges of the slots in the outer cylinder. The design is in this case that the paper should rotate on the outer circumference of the tube C', which is made smooth and polished for that purpose. The paper is fed by means of the feed-wheels B B, which engage with the paper through the slot P. Whether or not an outer cylinder is used the wheel B may be made to travel in the same manner as the wheel upon the hub n^3, Fig. 1—that is to say, it may have a gradual movement of translation bodily in an axial line as well as a movement of rotation.

By making the circumference of the wheel B slightly less than that of the tube C', it will be seen that if the escapement-wheels with which B is directly connected be constructed, as hereinafter described, to have an enlarged or amplified feed for every whole revolution, then such enlarged feed will take place at a slightly different circumferential position at the end of every line upon the paper tube, thus compensating for the long spiral 27 on the edge of the paper and securing a practically uniform margin. This slight loss in the feed for every whole revolution of the escapement mechanism might obviously be made to take place by a proper proportioning of any portion of an intermediate gear between the escapement-wheel and the paper tube.

The general arrangement of the mechanism shown in Fig. 8 is substantially the same as that of Fig. 1, except that the ends of the shafts *e* and *r* are mounted in the standard *f* outside of but at the same end as the standard *b*. The support for the feed-wheel B may spring or yield slightly to allow the edge of the paper to be fed around beneath the wheel in applying a sheet of paper to the tube C'. It will be obvious that this modification of my invention, which consists in simply feeding a paper tube upon a suitable cylinder or support by means of a feed-wheel pressing the paper tube against the support, is applicable to constructions wherein the movement of translation of the feed-wheel B to provide for space between lines is produced by other means than by devices which distribute the movement of translation through the letter and word spacing of the line.

The escapement devices which control the feed of the paper are preferably constructed as follows: *h* is an electromagnet which operates the escapement-lever, and *a* is the lever for the anchor-escapement, the lever carrying the armature for the magnet, so that the magnet when excited will be moved in one direc-

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tion thereby. Movement in the opposite direction is produced by the retracting-spring u^5 or other suitable device applied to the tail of the lever u, which latter is mounted upon a suitable post h'. The lever u is formed at its end, as shown, into a fork, at the ends of which are the pallets of the anchor-escapement engaging, respectively, with the two toothed-wheels r^2 r^3 secured to the shaft s. Pallet u' engages with teeth of wheel r^2 and pallet u^3 with the teeth of wheel r^3. The latter pallet is formed as a yielding pallet. For this purpose it is properly pivoted at u^4 on one prong of the lever u. Against the tail of the lever bears a spring u^6, the office of which is to move the toe of the lever backward in a direction opposite to that in which the escapement-wheel rotates. A stop u^4 limits the movement of the pallet when it is engaged with the wheel and the latter is permitted to rotate through disengagement of the pallet u'. At u^7 is a back-stop for the pallet.

As already explained, the wheels r^2 r^3 are keyed together or suitably fixed upon the shaft s or other device through which the feed movement is communicated to the paper, power being applied to such escapement devices through the wheel s, also keyed to or fixed upon said shaft.

In order to provide an enlarged or amplified feed at the end of the line whereby the paper may be fed to the beginning of the next line, a blank space q is provided in the wheel r^3. The effect of this, as will be seen from the explanation presently to be given, is that when the pallet u^3 has been disengaged from the tooth at the left of the space q, and by its spring has had its toe moved into the blank space q, the wheel may move until the tooth at the right of the space q engages the toe of the pallet and has moved the pallet to a distance determined by the position of the stop u^4. This enlarged or amplified feed-space is adjusted to be sufficient to cover the space (proceeding in the direction of the ordinary feed,) from the end of one line circumferentially to the beginning of the next line, the proper vertical space-feed being produced in any proper way.

So far as concerns that feature of my invention which relates to the use of the yielding pallet, it will be obvious that it would not be necessary to use two escapement-wheels, but that both pallets might engage with the same wheel.

In order to provide for the proper operation of the pallet u' when the wheel rotates to bring the blank-space q around to the side of said pallet, I provide a separate wheel or set of teeth for said pallet to engage with.

In the drawings the escapement is supposed to be in an intermediate position between its two extremes of vibration. Assuming that the lever u is moving downward under the influence of the magnets h, which are excited as soon as an impression has been effected, when pallet u' disengages the wheels the latter may rotate, restrained only by the pallet u^3, which is engaged; but as the latter yields the wheel rotates until the limit of yielding in the pallet u^3 is reached by engagement of its heel with the stop-pin u^4, whereupon the wheels are locked from further movement. In this movement a proper feed of the paper takes place for letter or character spacing. On completion of the paper-feed movement the pallet u' will be in position to lock with the next tooth of the wheel r^2 in just the manner that it is locked in the drawings, and this it will do as soon as the magnet loses its power and the lever u is moved backward by the retractor u^5. In the course of this backward movement the pallet u^3 will be disengaged, but no or very little movement will follow the disengagement, because before disengagement the pallet u' will have engaged with the wheel r^3, and hence no feed of the paper will now take place. When the pallet u^3 is disengaged the spring u^6 moves its toe back to position where it will engage with the next tooth of the wheel r^3 as soon as the lever is moved downward slightly under the influence of the magnet, as shown in the drawings. In these operations no movement follows the disengagement of u^3, but its amount of yielding while engaged determines the extent of movement that shall follow the release of the wheels by the pallet u' during the letter-feed.

In the above-described anchor-escapement each tooth operates as a detent-tooth to free the escapement-wheel, but yet practically the whole movement of the latter will take place on movement of the anchor in one direction only.

When the wheels have rotated to bring the blank space q around opposite pallet u^3, then the amount of movement will be greatly increased when the magnet h is excited, the amount being then that of the blank space q plus the amount of feed allowed after the edge of the tooth at the right of the space has engaged the yielding pallet u^3, as already explained.

Type-wheel W′ is preferably constructed with two or more rings of type, as described in my prior patent, No. 487,981, and may be adjusted circumferentially and axially to the different positions required for printing its characters by means of various impelling devices brought into operation successively or simultaneously in proper combinations, as described in that patent and in my Patent No. 487,982.

F G H I J are armature-levers operated by corresponding adjuster-magnets numbered 1 2 3 4 5. These levers operate upon drivers and followers of any proper construction, as described in those patents, some to rotate the wheel and others to move it axially. The means shown for rotating the wheel herein are substantially those of my Patent No. 487,981; but those for producing the axial movement

are somewhat modified, being simplified particularly in their manner of application to the type-wheel shaft.

m^7 m^8 m^9 are the axially-moving drivers upon which the levers F G H operate, while i^7 i^8 i^9 are the corresponding followers. Each of the drivers is provided, as shown, with a collar having a groove within which project pins extending from prongs of the impelling-levers F G H, thereby allowing rotation of each driver, as well as endwise movement. Each follower has also a groove which prevents axial movement along its journal-bearing h. The propelling-levers I J operate upon the drivers m^7 m^8, giving them an endwise movement in line with shaft a of the type-wheel, and said drivers engage with followers i^7 i^8, which rotate parallel to the shaft of the type-wheel. Each end follower m^7 m^8 is provided with a spline which prevents its rotation in the bearing h^4. The shell i^6 of the follower i^7 is in direct engagement with shaft m^6, forming an axial extension of the type-wheel shaft a, but incapable of rotation therewith though adapted for endwise movement or axially. It is prevented from rotation by a spline engaging in the bearing h, and is connected with the shaft a, so as not to interfere with the rotation of the latter, but at the same time to move the latter axially in both directions by the devices indicated in Fig. 6, wherein j indicates a coupling which joins the flanges j^2 j^3 on the ends of the shafts a m^6, permitting them to rotate upon one another, but joining them axially. The extension m^6 is connected with the follower i^7 by any direct coupling, such as is shown in my prior patent for imparting positive movement of rotation to the follower from an axial movement of the driver, the connection being, however, in this instance reversed, so that the movement of rotation of the follower gives the axial movement to the shaft m^6. This connection, as shown, comprises a pin working in a spiral slot, but might be of any other positive nature, as described in my prior patents, for giving a positive movement in both directions. The details of these devices need not be more fully described as they are explicitly set forth in my prior patent, to which reference may be made.

The several magnets 1 2 3 4 5 may be brought into action in the proper combinations and either consecutively or simultaneously; but for illustration I shall herein describe them as brought into operation successively, as set forth in my Patent No. 487,982, the magnets being controlled in their operation by a series of selecting-relays U V W X Y brought into operation when a pulse is prolonged, strengthened, or modified.

The relays, which are preferably polarized, are respectively connected to the contacts 3 5 2 1 4 of a sunflower or distributer, which is kept in operation by means of the magnets m^{11}, operating in an escapement-lever for the escape-wheel shaft a'', carrying a trailer T, working over the contacts, and are thereby connected in turn through spring x and hub of a'' with the circuit of a battery N. The magnets m^{12} are alternately energized by the main-line polarized relay R, controlling the circuit of local battery O, as described in that patent, and in the circuit of said battery is a differential magnet whose two coils are in circuit, respectively, from the two contacts of the relay. The magnet S operates on the prolongation or strengthening of an impulse through one or the other of its differential coils to close the circuit of the battery N, thereby energizing the selecting-relay upon whose segment of the sunflower the trailer may be at that time resting.

If the pulses are short and follow each other in rapid succession, the current through one coil only overcomes the effect of a current through the other, and as a result the core remains unmagnetized. When, however, the current in either coil is prolonged, its effect will overcome the effect of magnetism due to the other coil, and as a result relay S is brought into action.

The several relays control the adjuster-magnets in the order indicated by the numbers of the adjuster-magnets and the sunflower-contacts, for the reason that it is desirable to first bring into action or close the circuit of that adjuster-magnet whose follower has the greater distance to move, as described in my Patent No. 487,982. The final segment 6 of the sunflower is that over which the circuit of a restoring-battery N′ is closed for the purpose of restoring the armature-levers of the selecting-relays to normal position.

The press p' may be operated by a magnet or magnets brought into operation in the manner described in my Patent No. 487,982—that is to say, by a contact on the shaft a'' of the sunflower. This circuit-closer is adjusted to momentarily close the circuit of the press-magnet a little before and during contact between the sunflower-arm and contact 6—that is to say, near the end of each whole revolution of the sunflower after it has completed the connections of the several contacts or segments leading to the selecting-relays.

The local battery whereby the press is operated is indicated at J′ in the diagram.

B′ is the circuit-closer contact on the shaft a'', which, by means of the spring b^{13}, closes the connection for the press-magnet from battery J′ through a spring b^{11} resting on an insulated metal cylinder b^{14} on the shaft a'', the contact B′ forming an extension of or being connected with said cylinder, as indicated.

In printing-telegraphs the practice has usually been to operate the press-pad in one direction by electromagnetism and in the opposite direction by a spring or other suitable mechanical retractor; but for my purposes said press must be actuated with great rapidity in both directions, and it will be found desirable to replace the ordinary retracting-spring by electromagnetism, the purpose be-

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ing to secure a positive and extremely rapid movement of the pad, as is necessary in my improved printing-telegraph system, wherein the impressions succeed one another with great rapidity.

Various forms and arrangements of electro-magnets suitable for use in producing positive movement in both directions will readily occur to electricians as applicable to the press-pad. The action might be by reversals of magnetism, by variations in the balance of magnetic force, or by intermittent action of magnets; but I will, for the sake of illustration, assume the use of intermittently or alternately acting magnets operating by attraction upon the press-lever, one operating to produce the impression, the other to reverse the movement of the press-lever and restore it to normal.

c c' are the two magnets of the press-lever. The press-lever f^3, pivoted at p^3 in the standard e^3, carries two armatures, one operated by the magnet c' and the other by the magnet c, said armatures being at opposite sides of the fulcrum p^3, so that magnet c' may serve to operate the press to cause an impression, and magnet c may restore the press to the normal position. Magnet c' being in the connection from spring b^{13}, as shown in the diagram is operated, as already stated momentarily just before the completion of a revolution of the sunflower-arm. Magnet c is in the connection from the spring b^{13} bearing on the cylinder b^{14}, but having in its path a circuit interrupting or insulating space, so that just before b^{13} closes the circuit for c' the circuit for magnet c will be open and remain open until the c' is broken, whereupon the circuit of c will be immediately re-established and positively draw back the press-pad. The circuit of c remains established during the whole revolution of the sunflower, or until the point is reached where the magnet c' should come into operation when the circuit of c is interrupted. It is obviously not necessary that the circuit of c should be closed at all times, the design being only that magnet c should operate to positively restore the press to normal position as soon as c' has done its work.

As before described, the operation of the press might be through the action of a polarized magnet, as indicated in Fig. 10, but its action at the proper time and in the manner described in connection with magnets c c' would be controlled by suitable devices for reversing the current in the operating-magnet at the proper times, as already explained in connection with the operation of the press by the two magnets c c'.

The action of the escapement-magnet h to produce the feed after each impression can readily be controlled by closing the circuit thereof, as indicated clearly in the diagram, through the back-stop l for the press-lever.

J^2 is the battery whose circuit through h is thus closed and broken.

The operation of the escapement itself having been already described, it is not necessary to set forth the operation more in detail in conjunction with the other devices, as its action at the termination of each impression will be apparent from what has been already said.

I wish to be distinctly understood that I do not limit myself to imparting the axial movement to the tube at any particular time during the operation of printing a page, as it will be obvious that said axial movement might be imparted as herein described by moving it axially during the operation of printing a line, so that the said movement would be distributed through the letter and word spacing or that said axial movement might be made to take place at the completion of the line and in the interval between said completion and the beginning of the printing of the next line.

My invention therefore consists, broadly, in giving said axial movement to the tube by any proper mechanism, whether the same operate, as already set forth, to distribute the movement, or whether it operate only at the end of the line and before the beginning of the next.

What I claim as my invention is—

1. In a type printing apparatus, a blank formed as an endless band or tube in combination with means for moving the blank step-by-step in the same direction both for letter and word spaces, and by an enlarged single step across the space between the end of one line and the beginning of the next.

2. In a type printing machine, a blank returning upon itself to bring its edges together, in combination with means for feeding said blank in the direction of the letter space feed from the end of one line to the beginning of the next by a lengthened feed step.

3. In a type printing machine, a blank mounted in the machine as an endless band or tube upon which the lines are printed circumferentially or in the direction of the travel of the band, in combination with step-by-step mechanism for moving the band or tube in the direction of the letter or word space feed, said mechanism having a long feed space or spaces for crossing the edge at the end of the line to the beginning of a new line by a longer step or steps.

4. In a type printing machine, a paper or other blank mounted as a tube or endless band, in combination with means for feeding it in the same direction to print the lines around its circumference as well as to cross the gap from edge to edge of the blank by a lengthened feed step in order to begin a new line, and means for feeding said blank axially to cover the space between lines.

5. In a type printing machine, a paper blank formed as a tube or endless band, and a feeding mechanism rotating said blank adjusted to move by an enlarged or amplified step or steps at the end of a line.

6. The combination with the blank, feeding always in the same direction both for letter or word spaces and for the space from the end of one line to the beginning of the next, of a feed mechanism moving the blank in the direction of letter and word spaces having an enlarged or amplified feed space adjusted, as described, to come into operation at the end of each line.

7. In a type-by-type printer, the combination with a blank mounted to feed as an endless band or tube and with an edge forming a spiral or a diagonal to the line of feed as described, of a feeding mechanism operating always in the same direction and adjusted as described to feed said band or tube more or less than a complete rotation for each complete rotation of the feed controlling wheel.

8. In a type by type printer, a blank consisting of a tube adapted to rotate upon a stationary support, and a frictional feeding device engaging directly with the surface of the paper for feeding the same step by step.

9. In a type by type printer, the combination, substantially as described, of a tubular blank, a supporting cylinder within the same, and a frictional feed wheel engaging with the surface of the paper tube for rotating the same upon the cylinder.

10. In a type by type printer, the combination with the paper tube and the frictional feed wheel for rotating said tube step by step, of means for giving said wheel a movement of translation bodily parallel to the axis of the tube.

11. In a type by type printer, the combination with a blank formed as a tube or endless band, a fixed support therefor means for rotating the tube step by step upon its support and continuously in the same direction, as described, and means for giving said blank a movement of translation in the direction of its axis of rotation to produce the vertical space between lines.

12. In a type-by-type printer, the combination with the blank formed as a tube or endless band, of a continuously rotating feed shaft or wheel connected with said tube, a step by step escapement wheel carried by said shaft, and a screw shaft with which a pin or lug rotating with the tube engages, as and for the purpose described.

13. In a type-by-type printer, the combination of a paper feed wheel, a longitudinally slotted shaft supporting the same and connected with an escapement wheel, and a screw shaft with which a pin carried by the wheel engages through the slot.

14. In a type-by-type printer, the combination with a paper feed wheel, of a screw shaft, a hollow longitudinally slotted shaft surrounding the same, and a spring actuated pin connected with the wheel and engaging the screw thread, as and for the purpose described.

15. In a type by type printer, the combination, substantially as described, of a paper feed wheel, a longitudinally slotted spindle on which said wheel slides axially, and a screw shaft with the thread of which the wheel is connected through the slot, as and for the purpose described.

16. In a type printing machine, the combination substantially as described, with a paper feed, of a forked lever *a*, embracing an anchor escapement wheel, and a pivoted detent pallet mounted on one arm of said lever and provided with a spring for moving the toe of the pallet backward to meet an advancing tooth when the said pallet is moved radially away from engagement with the wheel.

17. The combination, substantially as described, with the paper feed in a type printing machine, of two toothed wheels r^1, r^2, and an anchor escapement one of whose pallets is yielding, as described, the two pallets thereof engaging respectively with said wheels.

18. The combination, substantially as described, with an anchor escapement having a yielding pallet, of two toothed wheels engaged respectively by the pallets, and one provided with a blank space, as and for the purpose described.

19. The combination, substantially as described, of two toothed wheels and an escapement lever having two pallets engaging respectively with said wheels, one of said pallets being pivoted as described and provided with a spring and stop, said spring being applied to move the toe of the pallet in a direction to meet the rotation of the wheel.

20. The combination with a type printer, of two toothed wheels connected with the feeding mechanism, one of said wheels having a blank space and an escapement lever, the pallets of which engage respectively with said wheels, as and for the purpose described.

21. In a printing telegraph, the combination of a type-wheel a press pad operated positively in both directions by an electro-magnet or magnets and means at the receiving station for energizing the said magnet or magnets in alternation first to effect an impression and then to withdraw the pad immediately and independently of the condition of the line circuit.

22. In a printing telegraph, the combination with the press mechanism, of two operating magnets, one acting to produce the impression, the other to restore the press to normal position, and means at the receiving station for energizing said magnets alternately.

23. The combination with the type wheel of a press pad, an armature lever carrying the same, two electro magnets acting on said lever at opposite sides of its fulcrum respectively and a circuit controller for throwing said magnets into circuit alternately one as soon as the type-wheel is set to position for printing and the other immediately thereafter to throw off the pad.

24. The combination with a type wheel having two or more rings of type and capable of an axial movement as well as a movement of rotation, of one or more drivers and followers

arranged in line with the axis of said wheel, said followers being capable of rotation in a plane parallel to the plane of rotation of the type-wheel, and means for converting the rotation of the final follower directly into an end thrust to produce an axial movement of the type wheel.

25. The combination with a type wheel having two or more rings of type, of means for moving said type wheel axially consisting of two or more axially movable drivers mounted in line with the type wheel axis, and two or more corresponding rotating followers rotating parallel with the type wheel, the final follower being connected directly with an axial extension of the type wheel shaft incapable of rotation but adapted to move axially.

26. The combination of a type wheel having three or more rings of type, of two series of rotating drivers and followers all arranged axially in line with the said wheel, and one of said series being provided with means for imparting a movement of rotation to the type wheel while the other series is provided with means for imparting an axial movement to said wheel, as and for the purpose described.

27. The combination with the selecting relays and a sunflower or distributer for closing connection to said relays in succession, of a differentially wound controlling magnet governing the circuit through the sunflower, and a main relay having front and back contacts connected respectively to the differential coils.

28. The combination with the selecting relays, of a differential magnet controlling the circuit thereof, and means for alternately closing the circuit of the differential coils by the main line pulsations.

29. The combination, substantially as described, with the selecting relays and the type wheel impelling devices controlled thereby, of a differential magnet governing the circuits of said selecting relays, said controlling magnet being adapted, as described, to respond to a prolongation or modification in a rapid succession of currents flowing through its coils alternately.

30. The combination, substantially as described, of a type-wheel adjusted to its various positions for printing by a series of impelling devices acting singly or in various combinations, a press apparatus brought into operation automatically on the completion of each cycle of actions in the type-wheel adjusting apparatus, a power-driven feed mechanism, an electro-magnet for releasing the same, and means for controlling said magnet to release said feed mechanism on the reverse movement of the press apparatus after each impression.

31. The combination, substantially as described, in a type by type printer, of a tubular blank and a step-by-step feed therefor, a sunflower or distributer governing the position of the type-wheel, a press apparatus controlled by said sunflower, and means for releasing the feed devices on reverse movement of the press after each impression.

32. The combination, substantially as described, in a type by type printer, of a paper feed mechanism, a wheel of which has an enlarged or amplified feed space as described, a driving power therefor, a step-by-step feed adjusted to release the paper feed mechanism on movement in one direction only, an electro-magnet controlling said step by step devices, and a press governing the circuit of said electro-magnet by a back contact.

33. In a type-by-type printer, a blank formed as an endless band or tube in combination with a stationary support therefor and paper feed devices engaging directly with the surface of the paper for rotating the blank continuously in the same direction in the printing of lines and for moving it axially to cover the space between lines.

34. The combination, substantially as described, of the paper feed devices and escapement mechanism acting to release the paper feed on movement in one direction only, an electro-magnet controlling the same, a press governing the circuit of said magnet, a sunflower or distributer for the type-wheel adjusting apparatus, and means for changing the circuit of the press magnet once for each cycle of changes produced by the sunflower or distributer.

Signed at New York, in the county of New York and State of New York, this 13th day of April, A. D. 1894.

CHARLES L. BUCKINGHAM.

Witnesses:

JOHN C. SANDERS,

WM. H. CAPEL.

1890

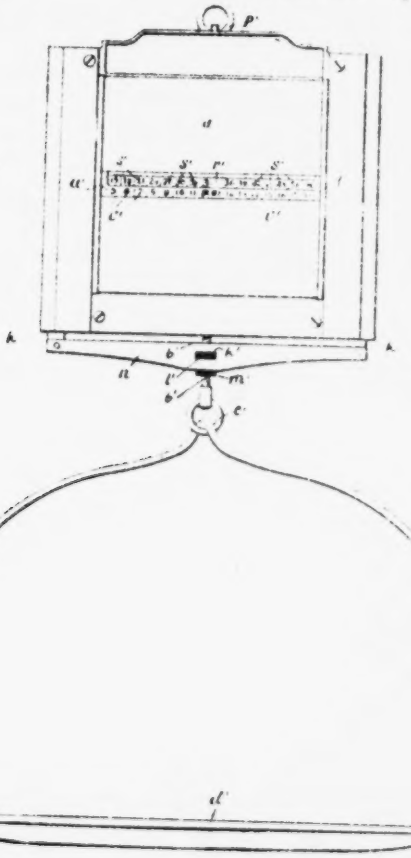
(No Model.) 859 4 Sheets—Sheet 1

A. U. SMITH.

AUTOMATIC COMPUTING SCALE.

No. 545,616. Patented Sept. 3, 1895.

Fig. 1.



WITNESSES:

J. F. Finch.

M. F. Singleton

INVENTOR

A. U. Smith

BY

J. M. Bowers Jr.

ATTORNEY

1301

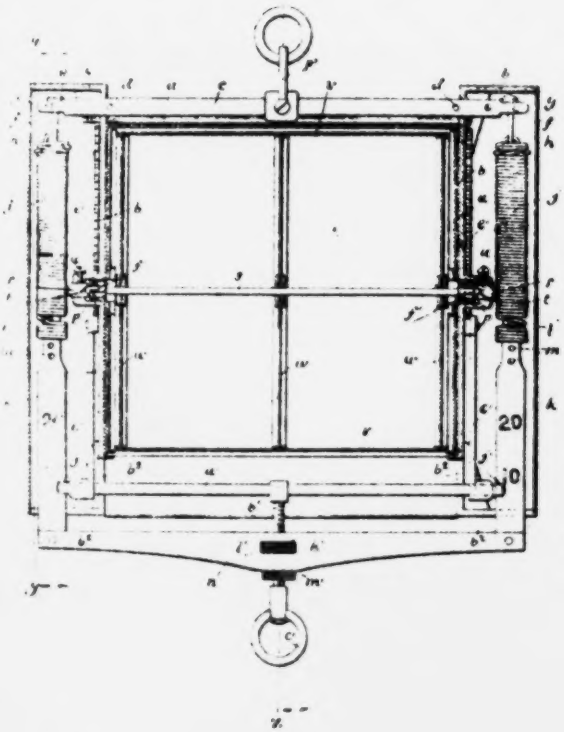
(No Model.) 4 Sheets—Sheet 2

861 A. U. SMITH.

AUTOMATIC COMPUTING SCALE.

No. 545,616. Patented Sept. 3, 1895.

Fig. 2.



WITNESSES:

J. J. Steele.
M. F. Snyder

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A. U. Smith
BY
ATTORNEY

1892

(No Model.)

863

4 Sheets—Sheet 3.

A. U. SMITH.

AUTOMATIC COMPUTING SCALE.

No. 545,616. Patented Sept. 3, 1895.

Fig. 3.

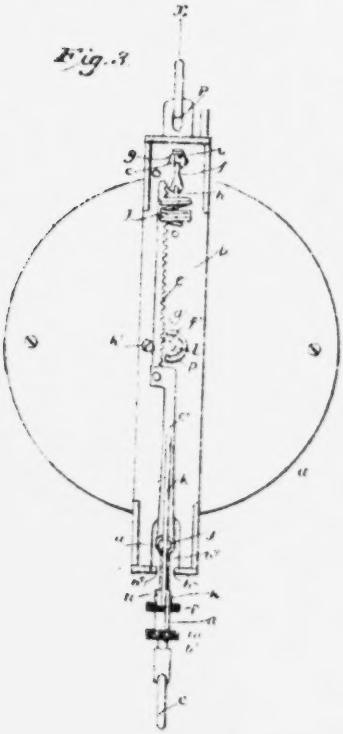
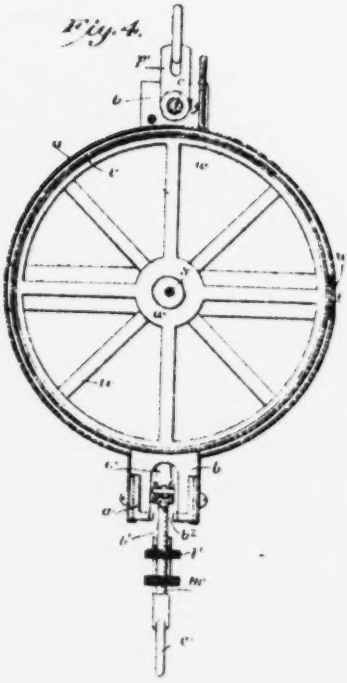


Fig. 4.



WITNESSES:

J. F. Finch.

M. T. Bugden

INVENTOR

A. U. Smith

BY

ATTORNEY

1303

865

(No Model.) 4 Sheets—Sheet 4.

A. U. SMITH.

AUTOMATIC COMPUTING SCALE.

No. 545,616. Patented Sept. 3, 1895.

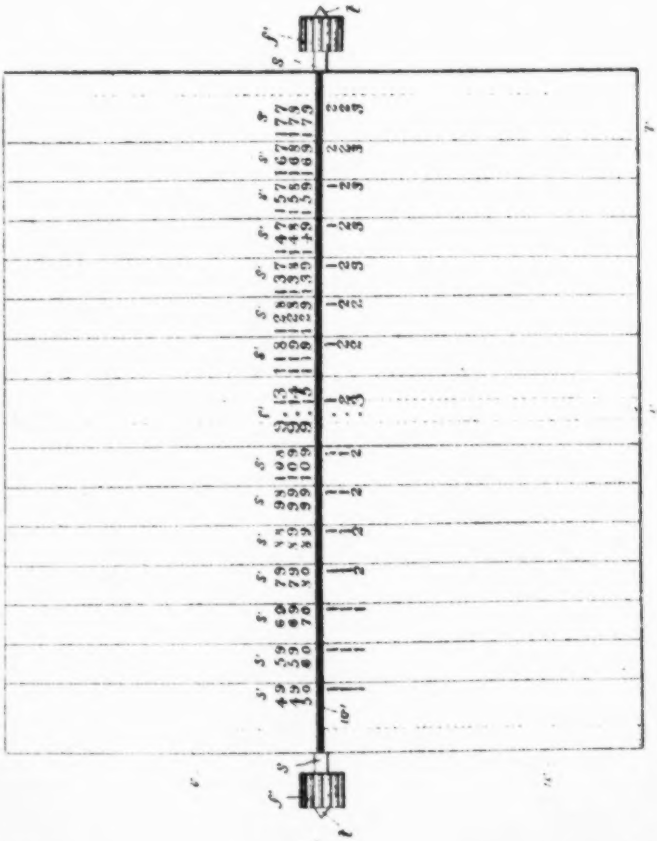


Fig. 5.

WITNESSES:
J. F. Finch.
M. T. Lingham

INVENTOR
A. U. Smith
BY
J. M. Chittenden
ATTORNEY

1304

867

UNITED STATES PATENT OFFICE.

ALBERT U. SMITH, OF SEYMOUR, ASSIGNOR OF ONE-HALF TO EDMOND C. SMITH, OF WESTPORT, CONNECTICUT.

AUTOMATIC COMPUTING-SCALE.

SPECIFICATION forming part of Letters Patent No. 545,616, dated September 3, 1895.

Application filed May 2, 1895. Serial No. 547,930. (No model.)

To all whom it may concern:

Be it known that I, ALBERT U. SMITH, a citizen of the United States, residing at Seymour, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Automatic Computing-Scales; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain new and useful improvements in weighing-scales whereon the weight and selling price of a commodity may be ascertained at a glance without any mental calculation on the part of the person using the same, but particularly resides in the details of construction and combination of elements, as will be fully hereinafter described, and specifically pointed out in the claims.

The object of my invention is to provide scales of this description which shall be extraordinarily sensitive to weights of small amount and to accurately register the same.

A further object of my invention is to provide an adjusting mechanism by the use of which the springs employed may at all times be held at a uniform tension, or, in other words, when said springs have become weakened or distorted by long usage the adjusting mechanism may be employed to restore a proper tension to said springs; also said adjusting mechanism may be used to set the scales at a "balance" after the weighing-pan is suspended therefrom, and the difference in weight of various kinds of weighing-pans may be compensated for by the use of this mechanism.

In the accompanying drawings, Figure 1 is a front elevation showing a weighing-pan suspended from the scales; Fig. 2, a section at the line *x x* of Fig. 3; Fig. 3, a section on the line *y y* of Fig. 2; Fig. 4, a section on the line *z z* of Fig. 2, and Fig. 5 a detail elevation of the indicator-drum.

Similar letters of reference indicate like parts in the several figures of the drawings.

a is the casing, on opposite sides of which are rigidly secured uprights *b*.

c is a cross-bar loosely journaled in the uprights *b* above the top of the casing, but held as against lengthwise movement by pins *d*, which pass through said bar. The ends of the cross-bar *c* are notched, as shown at *e* in Fig. 3, and the headed draft-pins *f* are loosely held within these notches by keeper-pins *g*. The said draft-pins have secured loosely in their lower ends bow-shaped clips *h*, the ends of which are inserted between the coils of the springs *j*.

k are draft-rods the upper ends of which are connected to the lower coils of the springs *j* by means of clips *l*, similar to the clips *h*, which are pivotally connected to the rods *k* by simply inserting said clips through perforations *m* in said rods. Each of the rods *k* has a series of these perforations *m*, so that a greater or lesser length of spring may be used, as the exigencies of the case require. The lower ends of the draft-rods are pivotally connected by a yoke *n*.

p are hollow bosses formed integral with the uprights *b*, within the outer extremities of which are adjustable bearings *r* for the shaft *s*. The ends of the shaft *s* are formed into cone-journals *t*, and the bearings *r* for this shaft are correspondingly shaped. *u* are set-screws for holding said bearings in place after a proper adjustment has been made.

v is an indicator-drum, which is rigidly secured to the shaft *s*. It is a very essential feature that the indicator-drum in scales of this nature should be made of very light material, for the reason that if it be not so made the sensitiveness and accuracy of the scales will be more or less affected. For instance, heretofore in scales of this character if a given quantity is weighed successively a number of times it will be found that said scales scarcely ever indicate the weight of such quantity twice exactly the same, there always being some slight variation in the amount registered. This is in a great measure due to the fact that the more the actual weight of the indicator-drum itself the greater must be the force necessary to operate it, and in order to overcome this disadvantage I have constructed the drum of thin skeleton frames *w*, of aluminum, while the periphery is formed of a thin sheet *x* paper pasted to the frames. In this way I have secured a structure that is

so light that the force necessary to operate it is almost insignificant.

a' is a cross rod, to which is secured a screw b'. The screw b' passes loosely through the yoke n, as shown at Fig. 4, and has within its lower end a ring c', from which the scale-pan d' is suspended.

Pivoted to the cross-bar a' are rack-bars e', which engage pinions f', rigid with the shaft x. The hollow bosses p are at one side slotted or cut away, as shown at g' in Fig. 3, so that the rack-bars may be permitted to engage the pinions f'.

h' are keepers, (but one shown,) which insure the engagement of the rack-bars and pinions.

The ends of the cross rod a' are notched, as shown at j', and said ends embrace the edges of the draft-rods k in such manner as to be capable of sliding thereon.

l' is a slot in the yoke n, and within this slot is an adjusting-nut l', which takes on the thread of the screw b'. m' is a set-screw on the lower portion of said screw. By revolving the nut l' the cross-rod a', to which the screw b' is connected, will be caused to move up or down, as the case may be, carrying with it the rack-bars e', which will, through the pinions f', effect the rotation of the indicator-drum as may be desired. Thus should the scales when at rest indicate anything other than a perfect balance or zero, by turning the nuts l' m' the drum may be brought into proper relative position and there secured without disturbing the tension of the springs j. Should it be found necessary to increase or diminish the tension of the springs j, this may be easily effected by advancing the clips h along the coils of said springs after the manner of advancing a nut along a screw-thread. The lower portions of the uprights b are formed into guideways b^2, through which the ends of the cross-rod a' and said draft-rods k pass, so that said rods will be properly guided in their movements.

The cross-bar c is provided with a ring-clip p', by means of which the scales may be suspended from any suitable support.

Around the periphery of the drum v, at the central portion of the same, is a scale r', (see Figs. 1 and 5,) indicating pounds and ounces. s' are columns of figures parallel with the scale r' and arranged in alignment therewith, which indicate the total amount in money for which a commodity should be sold after it has been weighed.

t' is an opening in the face of the casing a, within which is fitted a glass u', through which may be seen the figures on the periphery of the drum. The glass u' has printed or suitably inscribed thereon a series of figures v', which register with the columns of figures s' and indicate various prices per pound.

The central portion of the glass has marked thereon the abbreviations "P." and "Oz.," and the scale r' on the periphery of the drum is adapted to register with these characters. Supposing that some article which weighs exactly three pounds has been placed in the weighing-pan of the scales, the indicator-drum will be brought to a position where the figure 3 in the column of pounds on the scale of the drum will be disclosed to view, as shown in Fig. 1. Supposing, also, that the price of such article is eight cents per pound; the operator will consult the series of figures on the glass until the number 8 is reached, when immediately above it will appear the total value of the article—*i. e.*, 24.

In Fig. 5 I have shown a detail view of the face of the drum, whereon the figures are inscribed, and the broad straight line c' shown in this figure is intended to show through the glass u' when the scales are at rest and at a balance or zero.

I am aware that computing-scales have heretofore been constructed wherein a drum or cylinder is employed having the divisions of the weight-scale and other figures on its periphery, whereby the total selling price of an article may be determined without mental calculation on the part of the operator, and I am also aware that said drum has been operated by a rack-bar and pinion, and I therefore do not broadly make any claim to these features; but

What I do claim, and desire to secure by Letters Patent, is

1. The combination of the casing a the uprights b rigid with the sides thereof, the cross bar c, the draft rods k connected at their lower ends by a yoke n, the springs interposed between said draft rods and cross bar in the manner specified, the indicator drum journaled within the uprights and carrying pinions which are engaged by rack bars, the cross rod a' to which the lower ends of the rack bars are connected, the screw b' depending from the cross rod and passing through the yoke n, and the set nuts on said screw, substantially as and for the purpose set forth.

2. The combination of the indicator drum constructed of thin skeleton frames of a very light material, the periphery of said drum being formed of a sheet of paper having the divisions of the weight scale and other numerals printed thereon, the pinions carried by the shaft of said drum, adjustable conical bearings wherein said shaft is journaled, the cross bar c having a suspending clip secured thereon, the headed draft pins supported loosely within the notched ends of the cross bar c after the manner of a stirrup connection, the bow shaped clips in the ends of the draft pins, the springs between the coils of which said clips are inserted, whereby the tension on said springs may be altered as described, the draft rods k, the yoke n whereby said rods are connected, the cross rod a' to which the rack bars are pivoted and whose ends are notched and embrace said draft rods so as to be capable of sliding thereon, a ring from which the scale pan is suspended, and suitable adjusting connections between the

n and said cross rod a', substantially as ribed.

The combination of the casing a, the up- ts b rigid with the sides thereof, the cross , the draft rods k connected at their lower is by a yoke n, the springs interposed be- en said draft rods and cross bar, the indi- or drum journaled within the uprights and rying pinions, the rack bars engaging with d pinions, the cross rod a' to which the er ends of the rack bars are connected, d the pin b' pivoted to said cross rod and idly connected with the yoke n as to ver- al movement and provided with means hereby a scale pan may be attached, sub- antially as set forth.

4. The combination of the cross rod a', the rings connected at their upper extremities to a stationary part of the scale, the draft rods suspended from the lower extremities of said springs, the yoke connecting the lower ends of said draft rods, the pin b' pivoted to the cross rod a' and depending therefrom and provided at its lower extremity with means for attaching a scale pan said pan being rigidly connected with the yoke n as to vertical movement, the rotatory weight indicating device, and means carried by the cross rod a' for operating said device, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ALBERT U. SMITH.

Witnesses:
F. W. SMITH, Jr.,
M. T. LONGDEN.

1307

(No Model.)

871

3 Sheets—Sheet 1.

F. L. FULLER

CASH INDICATOR.

No. 585,467. Patented June 29, 1897.

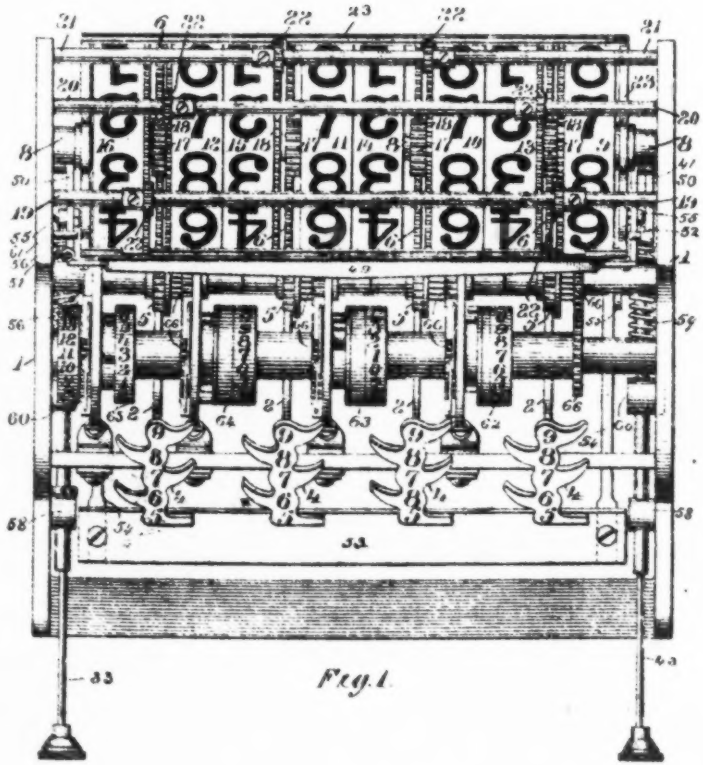


Fig. 1.

WITNESSES.

Wm. J. Dawes

A. J. Turner

INVENTOR

FREDERICK L. FULLER

by his attorney

D. A. Hubbard.

1308

873

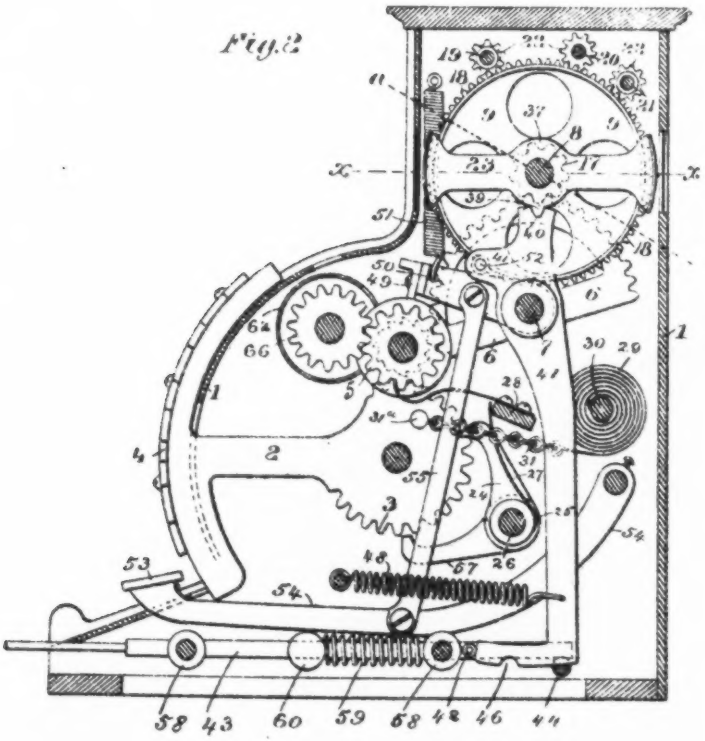
(No Model.) 3 Sheets—Sheet 2

F. L. FULLER.

CASH INDICATOR.

No. 585,467. Patented June 29, 1897.

Fig. 2



WITNESSES

Wm. J. Danner

A. J. Tanner

INVENTOR

FREDERICK L. FULLER

by his attorney

D. H. Hubbard

1309

(No Model.) 875 3 Sheets—Sheet 3

F. L. FULLER.

CASH INDICATOR.

No. 585,467. Patented June 29, 1897.

Fig. 3.

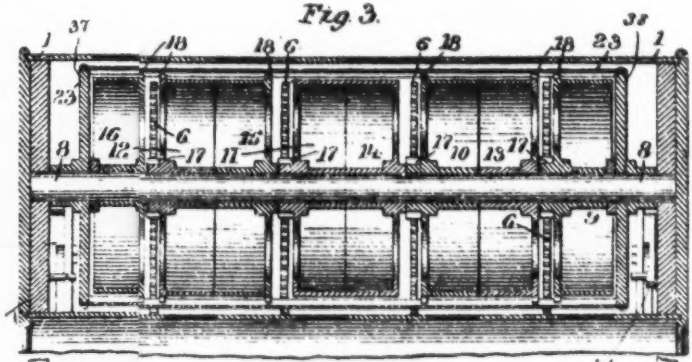


Fig. 4.

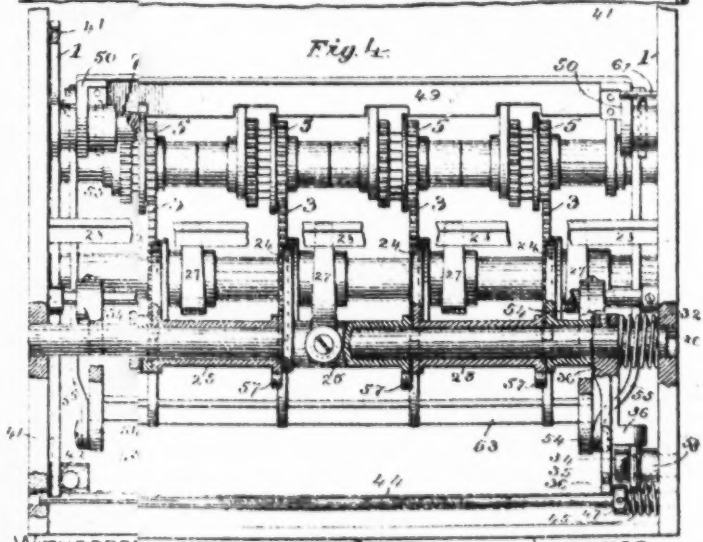


Fig. 5.

WITNESSES:

Wm. J. Danny

A. J. Gaines

INVENTOR

FREDERICK L. FULLER

by his attorney

J. A. Hubbard

1510

877

UNITED STATES PATENT OFFICE.

FREDERICK LINCOLN FULLER, OF WATERBURY, CONNECTICUT.

CASH-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 585,467, dated June 29, 1897.

Application filed February 6, 1891. Serial No. 380,411. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK LINCOLN FULLER, a citizen of the United States, residing at Waterbury, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Cash-Indicators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain novel and useful improvements in cash registers and indicators, but is more particularly designed as an improvement upon the construction shown and described in certain Letters Patent of the United States granted to me jointly with George H. Griswold the 4th day of February, 1890, and numbered 420,554 and 420,555. In the patents just referred to a set of indicating-wheels is provided by means whereof the sum indicated may be shown to the purchaser, but these wheels are visible from one side of the machine only. In my present invention the case is provided with openings both at the front and at the rear, and two sets of indicating-wheels are mounted therein and so connected together that the amount indicated appears both at the front and the rear side of the machine with the figures both right side up and reading properly—that is, from left to right.

With these ends in view my invention consists in the arrangement and the connection of the indicators, and also in the details of construction and the several combinations of cooperating elements hereinafter to be fully and in detail explained, and then recited in the claims.

In order that those skilled in the art to which my invention appertains may fully understand its construction and method of operation, I will describe the same in detail, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a plan view of a machine embodying my invention, the case being removed; Fig. 2, an end elevation, the case being sectioned; Fig. 3, a horizontal section on the line *x x* of Fig. 2; Fig. 4, a partial rear elevation, and Fig. 5 a detail of one of the push-rods.

Like numerals denote the same parts in all the figures of the drawings.

1 represents the inclosing case. Within this case are fulcrumed a number of operating-levers 2, each provided with a toothed segment 3 and an operating-handle 4. These mesh with and are adapted to operate gears 5, which in turn take into a segment or partial gear 6, mounted upon a shaft 7. As will of course be readily understood, the number of the partial gears 6 is equal to the number of the operating-levers. In the present case that number is four.

8 is a shaft journaled between the ends of the case or frame. This shaft affords a bearing for eight indicating-wheels, four of which have their figures so arranged as to show right side up at the openings on one side of the case and the alternate four are adapted to show in front of the openings in the other side of the case. In order that these may be clearly distinguished, I have denoted those which appear at one side by the numerals 9, 10, 11, and 12, and those which appear at the other side by 13, 14, 15, and 16. Each of the wheels 9, 10, 11, and 12 carries a gear 17, which meshes with and is operated by one of partial gears 6. Each of the wheels, except the two central wheels, which will presently be described, is provided with a gear 18, affixed to the side thereof and a little larger in diameter than the wheel.

19, 20, and 21 are shafts journaled between the ends of the frame. Each carries two pinions 22. The pinions on the shaft 19 engage with the gears 18 upon the wheels 9 and 16. The pinions upon the shaft 20 in like manner engage the gears 17 and 15, and the pinions upon the shaft 21 engage with the gears upon the wheels 10 and 14, so that movement applied to any of these wheels will be transmitted through the shaft and pinions to one other wheel of the series. It will be observed that there are four couples of wheels, but only three shafts. The two wheels 11 and 14 lying together are simply connected so as to operate as one part, their contiguity rendering the shaft unnecessary. The operation of this part of my invention may be best

described by supposing that an amount, say "$1.47," is to be indicated and totalized. To do this, the units-operating lever is depressed by means of the "7" handle. Said lever through the gears 5 and 6 operates the wheel 9, so that the figure "7" thereon is brought in front of the opening in the easement the operator. This movement of the wheel 9, however, through the gears 18, pinions 22, and shaft 19, operates the wheel 16 at the other end of the case so as to bring the figure "7" in front of that opening which is in the units-space when viewed from the side of the machine away from the operator. The tens or dimes lever is then depressed by means of the "4" handle, whereupon the wheel 10 shows "4" to the operator and the wheel 15 shows "4" in the tens space at the rear of the machine. Then in like manner the dollars or hundreds lever is depressed by the "1" handle, thereby so moving the double wheel 11 14 that the figure "1" appears on both sides in the hundreds place.

Each segment 3 is provided with a detent 24, carried by a sleeve 25, mounted loosely upon a longitudinally-movable shaft 26, for preventing return of the handles 2 after they have been depressed. The detents 24 are held yieldingly in engagement with their respective segments by springs 27, secured to the sleeves and engaging the under face of a plate or strip 28, extending across the machine. Each segment is also provided with a flat helical spring 29, connected at one end to a stationary shaft or rod 30, extending across the rear of the machine and flexibly connected by means of a chain 31 to studs 31ª on the operating-lever of the segment eccentrically to its center.

The detents 24 are held normally in engagement with their segments by a spring 32 between the end of shaft 26 and the frame of the machine. They are thrown out of engagement therewith by a rod 33, extending outside the machine and rearwardly therein and provided at its inner end with an inclined or cam-shaped portion 34, which upon the inward movement of rod 33 engages a pin 35, projecting downwardly from a bracket or arm 36, secured to the end of shaft 26. Upon the inward movement of rod 33, therefore, its inner end engaging pin 35 will move the arm 36, and with it the shaft 26, toward the frame of the machine (from left to right, Fig. 4) against the pressure of spring 32, thus moving the detents 24, carried by said shaft, sidewise out of engagement with the segment. Upon the withdrawal of the rod 33 the parts, including the shaft, the detents, and the arm 36, are all returned to normal position by the spring 32.

In connection with the indicating devices and the sight-openings, through which the indications are read, is employed a shutter 23, consisting of a plate for each sight-opening (two being shown in the present case) connected to sleeves or hubs 37 38, loosely mounted on shaft 8. The hub 37 is provided with a notch or tooth 39, which is engaged by a corresponding tooth or notch 40 upon the upper end of a lever 41, fulcrumed upon shaft 7 and extending downwardly into position to be engaged by a pin 42 upon the inner end of a longitudinally-movable rod 43, similar to the rod 33, but on the opposite side of the machine. Beneath the foot of lever 41 and extending across the machine at its rear is a longitudinally-movable shaft or locking-bolt 44, one end of which is cut away slightly to permit the passage of the foot of the lever, and the other end of which is provided with a spring 45, which when the lever 41 has been moved rearwardly sufficiently to bring a recess 46 in the foot of the lever into register with shaft 44 moves the shaft longitudinally through and into engagement with said recess, so as to lock the lever against further movement in either direction.

The shaft 44 is disengaged from the lever 41, so as to release the shutter by the bracket 36, which engages a collar 47 on said shaft and which when moved sidewise by the rod 33, as before described, also moves said shaft in the same direction against the pressure of spring 45 until the cut-away portion of shaft 44 again registers with the foot of the lever, when a spring 48, connected to the lever and to the frame of the machine, returns the lever to normal position.

In connection with the indicating mechanism also there is employed a locking mechanism, operated from the shutter-operating mechanism, for locking the indicating mechanism when the shutter is moved to expose the indication and while it retains that position. This locking mechanism consists of locking-plate 49, extending across the machine and supported from arms 50, loosely mounted on shaft 7. The locking-plate 49 is held normally elevated out of locking position by a spring 51, connected to the plate and the frame of the machine, and is depressed to locking position into engagement with gear 5 by a pin 52, carried by lever 41, which, when the foot of said lever is moved rearwardly by rod 43 engaging one of the arms 50, moves the latter and the plate 49 downwardly into engagement with the gear and holds the plate in that position until the shutter mechanism is released and returned to normal position.

The locking-plate 49 is also adapted to be operated each time one of the handles 4 is depressed from a stop-plate 53, pivoted by arms 54 to the rear of the machine and connected by links 55 to the arms 50, supporting the locking-plate 49. The stop-plate 53, by engaging the hand of the operator, arrests the downward movement of the handles 4, but is itself slightly depressed when the hand comes in contact with it. When thus depressed, it moves the locking-plate 49 into engagement with the gear 5, and when relieved of the pressure of the hand it, with the

locking-plate, is returned to normal position by spring 57.

The operation is as follows: When the handles 4 have been depressed to make an indication, as before described, the handles depressed will be prevented from returning by the detents 24, the shutter during this operation remaining in its normal position, closing the sight-openings. To expose the indication, the operator will shove the rod 43 inwardly and through the pin 42 rock the lever 41 on its fulcrum into engagement with shaft 44, as before described. During this movement the upper end of the lever engaging the hub or sleeve of the shutter 23 will rock the latter from its horizontal position to that indicated by the dotted line in Fig. 2, thus uncovering the openings in front of the indicating-wheels. Simultaneously with this movement of the shutter the pin 52, engaging the arms 50, will, through the latter, move the locking-plate downwardly into engagement with the gears 5, thus locking the indicating mechanism against operation. The parts are held in this condition so long as shaft 44 remains in engagement with the recess 46 in the foot of lever 41. To disengage said shaft and lever, the operator will press the rod 33 inwardly into engagement with arm or bracket 36, which is, as before described, thus thrust aside, and through it move the shaft 44 longitudinally against its spring 45 and out of engagement with lever 41, which is then, with the shutter 23, returned to normal position by the spring 48. Simultaneously the shaft 26, with the detent-carrying sleeves 25 thereon, is also moved longitudinally against its spring 32, thus moving the detents 24 sidewise out of engagement with their segments to permit the springs 29 to return the segments and indicator-wheels to normal position, when the rod 33, retracted by its spring 56, is disengaged from arm 36 and permits shafts 26 and 44 to resume their normal positions and the detents 24 to reengage their segments 3.

Connected to each detent-carrying sleeve 25 except the last is a detent 57 for engaging the next adjoining segment to the left to prevent simultaneous movement of adjoining segments. The detents 57 are normally disengaged from their segments, but as soon as one segment is actuated and throws its detent 24 upward the detent 57, carried by the sleeve of that detent, is thrown upwardly into engagement with the next adjoining segment.

The rods 33 43 are supported and guided in their backward and forward movements by bosses 58, secured to the frame, and the rod 43 is also provided with a retracting-spring 59, confined, like the spring 56 of rod 33, between a collar 60 on the rod and one of its supporting and guiding bosses 58. A stop 61 is also provided in the side frame of the machine which engages the upper sides of arms 50 of locking-plates 49 to limit the upward movement of the latter.

Registering mechanism is also provided, consisting of disks 62 63 64 65, representing, respectively, units, tens, hundreds, and thousands, operated, respectively, from the units, tens, &c., indicating mechanisms. The registering-disk of each series is operated by the gear 5 of that series through suitable pawl-and-ratchet mechanism and pinions 66 during the movement of the indicating mechanism in indicating direction, suitable transfer mechanism being interposed between the respective registering-disks for carrying amounts from one to the other.

What I claim is—

1. The combination with indicating and registering devices and operating-arms therefor, of a pivoted shutter normally obstructing the view of the indicating devices so as to conceal the indication, and means disconnected from and operated independently of the operating-arms for operating the shutter to disclose the indication, substantially as described.

2. The combination with indicating and registering devices and operating-arms therefor, of a pivoted shutter normally obstructing the view of the indicating devices so as to conceal the indication, means disconnected from and operated independently of the operating-arms for operating the shutter to disclose the indication, and means for retaining the shutter in exposing position, substantially as described.

3. The combination with indicating and registering devices and operating-arms therefor, of a pivoted shutter normally obstructing the view of the indicating devices so as to conceal the indication, means disconnected from and operated independently of the operating-arms for operating the shutter to disclose the indication, means for retaining the shutter in exposing position, and means for releasing the shutter, substantially as described.

4. The combination with indicating and registering devices and operating-arms therefor, of a shutter normally obstructing the view of the indicating devices so as to conceal the indication, and a push-rod disconnected from and operated independently of the operating-arms for operating the shutter to disclose the indication, substantially as described.

5. The combination with indicating and registering devices and operating-arms therefor, of a shutter normally obstructing the view of the indicating devices so as to conceal the indication, a push-rod disconnected from and operated independently of the operating-arms for operating the shutter to disclose the indication, and a lock for retaining the shutter in exposing position, substantially as described.

6. The combination with indicating and registering devices and operating-arms therefor, of a shutter normally obstructing the view of the indicating devices so as to conceal the indication, a push-rod disconnected

from and operated independently of the operating-arms for operating the shutter to disclose the indication, a lock for retaining the shutter in exposing position, and a second push-rod for disengaging said lock to release the shutter, substantially as described.

7. The combination with indicating and registering devices and operating-arms therefor, of a shutter normally obstructing the view of the indicating devices so as to conceal the indication, means disconnected from and operated independently of the operating-arms for operating the shutter to disclose the indication, a lock for engaging and locking said indicating devices, and connections between the shutter mechanism and said lock for operating the latter upon the operation of the shutter to expose the indication, substantially as described.

8. The combination with indicating and registering devices and operating-arms therefor, of a shutter normally obstructing the view of the indicating devices so as to conceal the indication, means disconnected from and operated independently of the operating-arms for operating the shutter to disclose the indication, a lock for engaging and locking said indicating devices, connections between the shutter mechanism and said lock for operating the latter upon the operation of the shutter to expose the indication, a lock for retaining the shutter in exposing position, and means for disengaging said shutter-lock to release the shutter, substantially as described.

9. The combination with indicating and registering devices and operating-arms therefor, of a shutter normally obstructing the view of the indicating devices so as to conceal the indication, means disconnected from and operated independently of the operating-arms for operating the shutter to disclose the indication, a lock for engaging and locking said indicating devices, connections between the shutter mechanism and said lock for operating the latter upon the operation of the shutter to expose the indication, detents for engaging and preventing return movement of the indicating devices, and means for simultaneously disengaging said lock and detents from the indicating devices, substantially as described.

10. The combination with indicating and registering devices and operating-arms therefor, of a shutter normally obstructing the view of the indicating devices so as to conceal the indication, means disconnected from and operated independently of the operating-arms for operating the shutter to disclose the indication, a lock for engaging and locking said indicating devices, connections between the shutter mechanism and said lock for throwing and holding the latter in engagement with the indicating devices, a lock for retaining the latter in exposing position, detents for engaging and preventing return movement of the indicating devices, and means engaging said shutter-lock and detents for simultaneously releasing said shutter and indicating devices, substantially as described.

11. The combination with indicating and registering devices and operating-arms therefor, of a shutter normally obstructing the view of the indicating devices so as to conceal the indication, means disconnected from and operated independently of the operating-arms for operating the shutter to disclose the indication, a lock for engaging and locking said indicating devices, connections between the shutter mechanism and said lock for throwing and holding the latter in engagement with the indicating devices, a lock for retaining the shutter in exposing position, detents for engaging and preventing return movement of the indicating devices, means engaging said shutter-lock and detents for simultaneously releasing said shutter and indicating devices, and spring mechanism for returning said shutter and indicating devices to normal position when released, substantially as described.

12. The combination with indicating devices and operating-arms therefor, of a shutter normally obstructing the view of the indicating devices so as to conceal the indication, a push-rod disconnected from and operated independently of said operating-arms for operating the shutter to expose the indication, a longitudinally-movable locking-bolt for retaining the shutter in exposing position, and a second push-rod engaging said locking-bolt for withdrawing it from engagement with the shutter so as to release the latter, substantially as described.

13. The combination with indicating and registering devices and operating-arms therefor movable varying distances, a lock for engaging said indicating devices, a depressible apron in proximity to the path of movement of said arms and adapted to be depressed by the hand of the operator in operating said arms, and connections between said apron and lock for throwing the latter into engagement with the indicating devices to arrest the movement of the latter, substantially as described.

14. The combination with indicating and registering devices and operating-arms therefor movable varying distances, a lock for engaging said indicating devices, a depressible apron in proximity to the path of movement of said arms and adapted to be depressed by the hand of the operator in operating said arms, connections between said apron and lock for throwing the latter into engagement with the indicating devices to arrest the movement of the latter, and a spring for sustaining the apron in elevated position, substantially as described.

15. The combination of two sets of indicating-wheels arranged in pairs, one set visible

from one side of the case, and the other set from the other side, connections between each pair of similar wheels whereby the same amount is shown on both sides of the case, a shutter normally obstructing the view of said indicating-wheels, means for actuating said shutter to simultaneously expose the indication, and means independent of said shutter-actuating means for operating one set of the indicating-wheels, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

FREDERICK LINCOLN FULLER.

Witnesses:

SHERMAN HARTWELL HUBBARD,

M. C. HINCHCLIFFE.

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(No Model.) 2 Sheets—Sheet 1.

C. F. & C. K. CHRISTOPHER.

READY CALCULATOR.

No. 588,128. Patented Aug. 17, 1897.

FIG. 1.

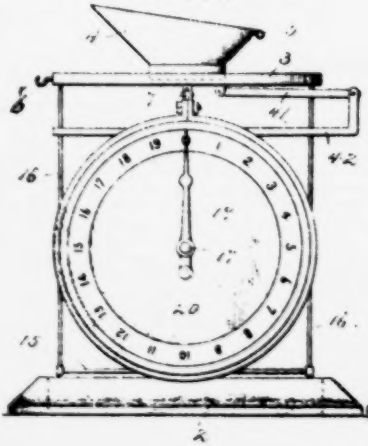


FIG. 4.

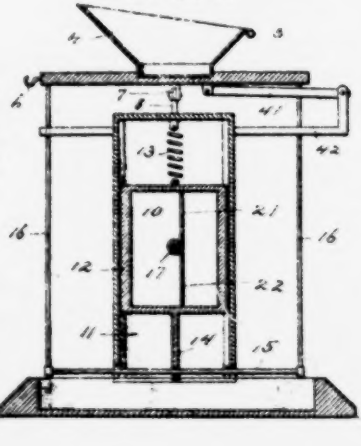
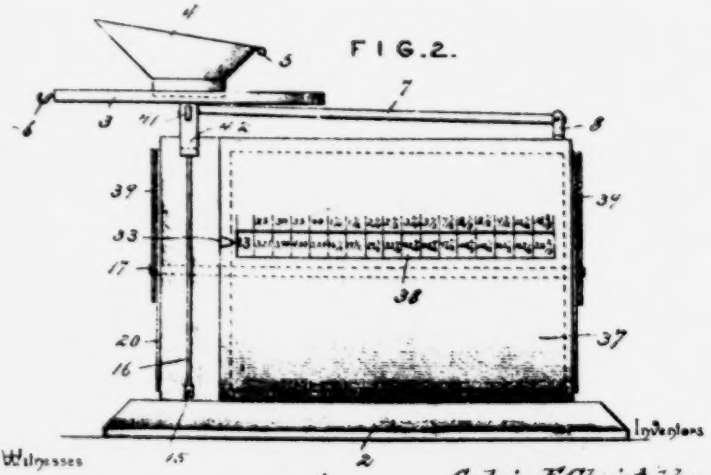


FIG. 2.



Witnesses

Harry L. Amer.
W. B. Hillyard

Inventors

By their Attorneys.

Calvin F. Christopher
Colonel K. Christopher.
Cashow & Co.

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(No Model.) 885 2 Sheets—Sheet 2

C. F. & C. K. CHRISTOPHER.

READY CALCULATOR.

No. 588,128. Patented Aug. 17, 1897.

FIG. 3.

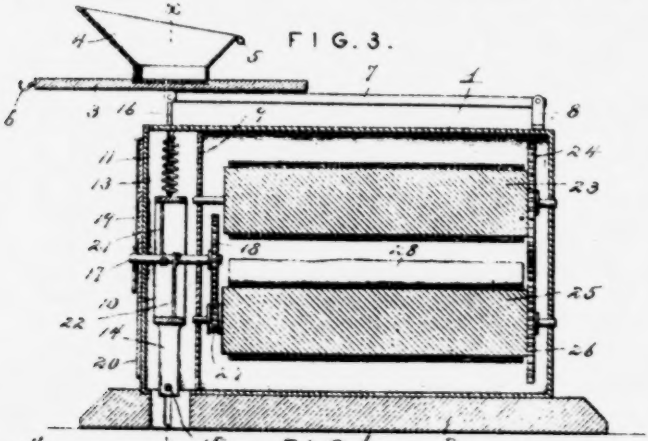


FIG. 6.

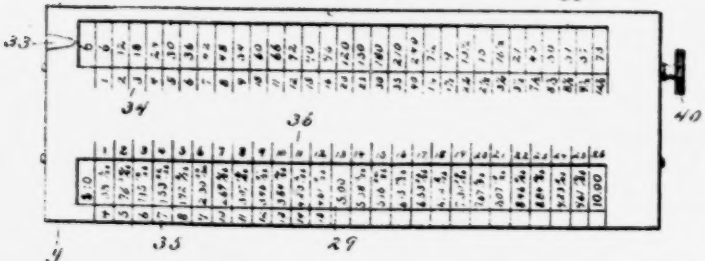


FIG. 7.

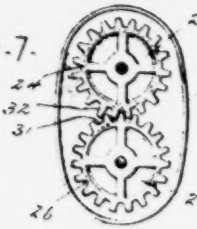
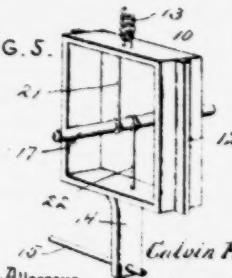


FIG. 5.



Witnesses

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U. B. Hillyard.

Inventors

Calvin F. Christopher

Colonel K. Christopher.

By their Attorneys.

C. A. Snow & Co.

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UNITED STATES PATENT OFFICE.

CALVIN F. CHRISTOPHER AND COLONEL K. CHRISTOPHER, OF SPARTANBURG, SOUTH CAROLINA.

READY CALCULATOR.

SPECIFICATION forming part of Letters Patent No. 588,128, dated August 17, 1897.

Application filed January 16, 1896. Serial No. 575,777. (No model.)

To all whom it may concern:

Be it known that we, CALVIN F. CHRISTOPHER and COLONEL K. CHRISTOPHER, citizens of the United States, residing at Spartanburg in the county of Spartanburg and State of South Carolina, have invented a new and useful Improvement in Ready Calculators, of which the following is a specification.

This invention relates to calculating devices for indicating the required amount or product of numbers, as duty, interest at any rate and for any length of time, labor, commodities, &c., can be quickly determined with out any mental effort or the exercise of manual energy.

The calculator is portable and can be made of such dimensions as to be carried in the pocket, or can be combined with a pair of weighing-scales to be operated automatically, so that the mass and the value of the same at a given rate can be read off.

For a full understanding of the merits and advantages of the invention reference is to be had to the accompanying drawings and the following description.

The improvement is susceptible of various changes in the form, proportion, and the minor details of construction without departing from the principle or sacrificing any of the advantages thereof, and to a full disclosure of the invention an illustration thereof is shown in the accompanying drawings, in which—

Figure 1 is an end view of a pair of weighing-scales equipped with the invention. Fig. 2 is a side elevation thereof. Fig. 3 is a longitudinal section showing a different arrangement of the parts. Fig. 4 is a section on the line X X of Fig. 3, looking to the right. Fig. 5 is a detail view of the movable frame, showing the relation of the pointer-supporting shaft and the actuating devices therefor. Fig. 6 is a top plan view of the calculator detached from the weighing mechanism and appearing as it will be constructed for carrying in the pocket. Fig. 7 is a section on the line Y Y of Fig. 6.

Corresponding and like parts will be designated and referred to in the following description and all the figures of the accompanying drawings by similar reference characters.

A casing 1 is mounted upon a platform 2 and incloses the operating parts of the calculator and the weighing mechanism and may be constructed of metal or any other material suitable for the purpose and will have a shape to conform to the parts inclosed thereby. A case 3 receives the commodity to be weighed and supports a scoop 4, in which such substances as sugar, coffee, &c., are placed to be weighed.

When it is required to weigh articles which can be placed directly upon the base 3, the scoop is removed, and in order to preserve the balance of the weighing apparatus the said scoop is suspended from the base 3, being provided with an eye 5 to engage with a hook 6 at the end of the base for the purpose. A bar 7 connects the base 3 with a stud 8, having connection with the casing, and the purpose of the bar 7 is to steady the base in its vertical movements attendant upon the weighing of articles. A partition 9 divides the casing so as to form a compartment at one end to receive the weighing mechanism and to form a support for the inner ends of the several shafts. A frame 10 is placed in the compartment 11 and is adapted to reciprocate vertically therein, being provided at its sides with vertical ribs 12, which operate in ways in the sides of the casing, so as to give proper direction to the frame in its reciprocating movements. A properly-tempered spring 13 connects the top of the frame 10 with the upper portion of the casing and serves to hold and to return the frame to a normal position. An extension 14 is pendent from the lower side of the frame 10, and through this extension passes a rod 15, which connects at its outer extremities with the lower ends of vertical rods 16 at the sides of the casing, and which rods 16 have attachment at their upper ends with the base 3. Thus it will be seen that any downward movement of the base 3 will cause a corresponding depression of the frame 10 by reason of the connections just described.

A shaft 17 is journaled in the partition 9 and the adjacent head or end of the casing and is provided at its inner end with a gear wheel 18 and at its outer end with a pointer 19, which cooperates with proper graduations

on a dial 20, so as to indicate correctly the mass or weight of the article or commodity placed either upon the base 3 or in the weighing-scoop 4. A cord or tape 21 is connected at its upper end with the top portion of the frame 10, and its lower end portion is wound around the shaft 17 and is connected therewith, and a companion cord 22 is secured at its lower end to the bottom portion of the frame 10, and its upper end portion is wound around the shaft 17 in a reverse direction to the lower end of the cord 21 and is secured to the said shaft. From this construction and arrangement of the cords or tapes 21 and 22 it will be seen that as the frame 10 reciprocates the shaft 17 will be positively rotated in each direction, and it will be observed that as one cord unwinds from the shaft 17 the other cord will wind thereon, thereby insuring a positive turning of the shaft 17 and the parts 18 and 19 connected therewith.

A roller 23 is journaled in the partition 9 and in the remote end or head of the casing and is provided with a gear-wheel 24, and a corresponding roller 25 is similarly mounted to the roller 23 and has a gear-wheel 26 at one end, which meshes with the gear-wheel 24, and a pinion 27 at its opposite end, in mesh with the gear-wheel 18, so that a rotation of the shaft 17 will impart a movement to the rollers 23 and 25, as will be readily comprehended. A strip 28 of paper, fabric, or like material is secured at its ends to the rollers 23 and 25 and is adapted to be reversely wound thereon, so that as the strip unwinds from one roller it will wind upon the opposite roller. This strip will have columns of figures upon each side, disposed in parallel lines, so as to indicate the desired results and computations in connection with corresponding numerals or figures at the sides of observation-openings 29 and 30 in the sides of the casing 1.

To prevent and limit the overwinding of the strip upon the rollers, the gear-wheels 24 and 26 are provided with a stop device consisting of a shallow tooth 31 and a long tooth 32 to interlock with the shallow tooth when the two teeth come together, such as commonly provided in a train of gearing to limit the number of revolutions of any required part thereof. A pointer 33 extends into the observation-opening 30, and its purpose is to indicate the correct position of the column of figures coming directly opposite, so that the proper column may be correctly designated in the event of a portion of two columns appearing through the opening.

When preparing and graduating the strip 28, the columns of figures are arranged so as to indicate units and fractional parts thereof, the numerals at the heads of the columns designating the pounds, yards, or other denominate values and the succeeding numerals representing the value when compared with the numerals bordering upon the marginal edge of the opening. For instance, referring to the right-hand column of Fig. 6, it will be seen that the topmost figure is "6," and if the article is represented by pounds a comparison thereof with the column of figures 34 on the left of the opening 30 will show that six pounds at one cent or one dollar a pound will be indicated by a corresponding numeral "6" opposite the numeral "1" in the column 34. Again, suppose the commodity be butter at thirty cents a pound and it be required to ascertain the value. By running down the column 34 until the numeral "30" is reached "180" will be found opposite the said numeral, showing that the value is one dollar and eighty cents. Suppose the article is to be measured. Then "6" will represent the number of yards, and if the price of the goods is thirty cents a yard the same result will be attained. The column of figures to the left hand of Fig. 6 is for indicating interest and wages, the line of figures 35 representing the rate of interest and the column of figures 36 designating the number of days. Suppose a person is earning ten dollars per month having twenty-six working days and it is required to ascertain how much is due for, say, twenty days. By running down the column of figures 36 until "20" is reached the amount seven dollars and sixty-nine cents and a fraction will appear opposite, and is the amount due. Like calculations are determined in a similar way, according to the value and quantity to be reckoned.

In the form shown in Fig. 2 a single roller 37 is employed, and its surface will be graduated similar to the strip 28, and only a single observation-opening 38 will be provided in the casing for the column of figures to be exposed through, and the journals of the roller will extend beyond the ends of the casing and each will have a pointer 39 to cooperate with the adjacent dials at the ends of the casing.

When the calculator is disconnected from the weighing mechanism and is used for ready reckoning, one or the other of the rollers will have its projecting journal provided with a knob 40, to be readily grasped for rotating the rollers so as to bring the required column of figures opposite the observation-openings.

To prevent lateral motion of the base 3, a bar 41 is supplied and is pivotally connected at its inner end to a lug pendent from the base 3 and has pivotal connection at its outer end to the vertical extension of a bracket-arm 42, secured to the casing, and this bracket-arm is extended and is apertured for the passage of the guide-rods 16, so as to direct the latter in their vertical movements. The bars 7 and 41 are free to follow the vertical movements of the base 3, but act jointly to prevent any material lateral play thereof, thereby maintaining the base 3 in proper working relation.

Having thus described the invention, what is claimed as new is—

1. In a combined weighing and calculating

mechanism, the combination of a casing having a slot and provided with a line of figures adjacent to the slot, a dial at one end of the casing, a shaft bearing a pointer to cooperate with the dial, a frame reciprocally mounted in the casing adjacent to the dial and guided in its vertical movements, and having the shaft passing therethrough, a weighing base or platform, side rods connecting the weighing-base with the reciprocal frame, a spring interposed between the casing and frame to hold the latter and the weighing-base in a normal position, a roller operated from the aforesaid shaft and bearing a series of columns of figures to be read in connection with the figures bordering upon the slot of the casing, and flexible connections secured at their outer ends to opposite portions of the reciprocating frame and having their inner ends connected with and reversely wound upon the aforesaid shaft, substantially as shown for the purpose described.

2. In a combined weighing and calculating mechanism, the combination of a casing having a longitudinal slot and a line of figures adjacent to the said slot, a weighing-base, means for yieldingly supporting the base, an indicating mechanism actuated by means of the weighing-base, a longitudinal bar pivoted at one end to the casing and having pivotal connection with the weighing-base, a second bar arranged approximately at right angles to the longitudinal bar and having pivotal connection with the casing and with the weighing-base, and a calculating mechanism cooperating with the line of figures bordering upon the said slot of the casing and controlled by the weighing-base, substantially as set forth for the purpose described.

3. In a combined weighing and calculating mechanism, the combination of a casing having a longitudinal slot and a line of figures bordering upon the said slot, a weighing-base, longitudinal and transverse bars pivotally supported at their outer ends and having pivotal connection with the weighing-base to steady the latter in its vertical movements, a reciprocating frame supporting the weighing-base, a spring for holding the reciprocating frame in a normal position, a dial, a shaft passing through the reciprocating frame and bearing a pointer to cooperate with the dial, flexible connections secured at their outer extremities to the ends of the reciprocating frame and having their inner terminals secured to and reversely wound upon the said shaft, and a roller mounted upon the said shaft and bearing a series of columns of figures to be read in connection with the figures bordering upon the slot of the casing, substantially as set forth.

4. In combination, a calculating mechanism, a shaft in gear with the calculating mechanism and bearing a pointer to cooperate with a suitably-graduated dial, a reciprocating frame having a pendent extension, a spring for returning and maintaining the reciprocating frame at a normal position, a base, a cross and side rods connecting the base with the said pendent extension of the frame, cords or tapes connecting the reciprocating frame with the shaft to positively rotate it in each direction, and a bar having pivotal connection with the base and with a support so as to steady the movements of the said base, substantially in the manner and for the purpose set forth.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

C. F. CHRISTOPHER.
C. K. CHRISTOPHER.

Witnesses:
JOHN H. SIGGERS,
G. C. SHOEMAKER.

(No Model.)

F. C. HOYT.

SPRING BALANCE COMPUTING SCALE.

No. 589,602. Patented Sept. 7, 1897.

Fig. 1.

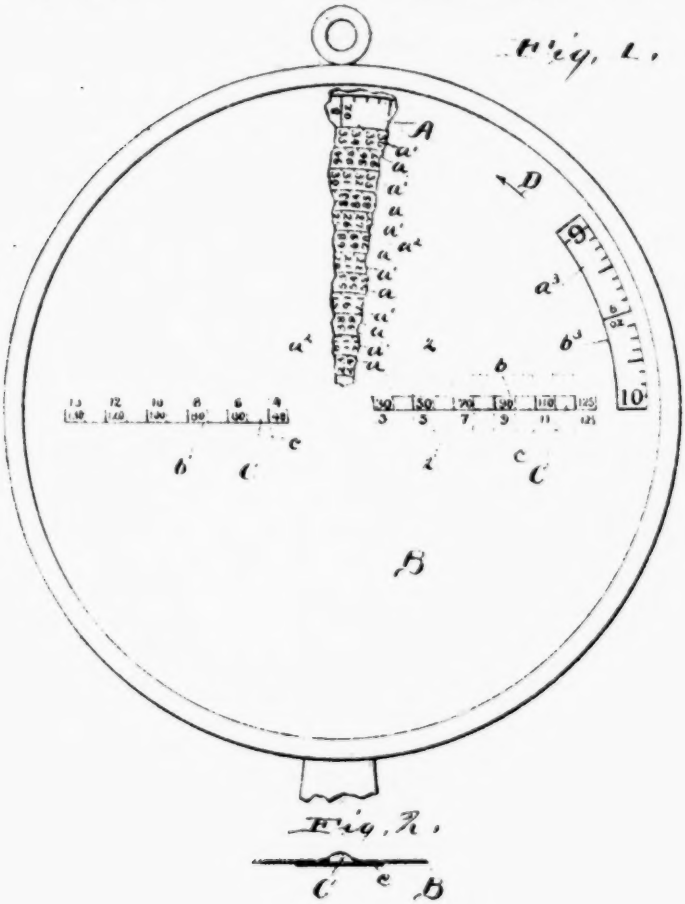

Fig. 2.

WITNESSES.
E. A. Keasbey
A. M. Rankin

INVENTOR.
Frank C. Hoyt
By C. L. Thurston
his attorney

1321

893 UNITED STATES PATENT OFFICE.

FRANK C. HOYT, OF CLEVELAND, OHIO.

SPRING-BALANCE COMPUTING-SCALE.

SPECIFICATION forming part of Letters Patent No. 589,602, dated September 7, 1897.

Application filed October 3, 1896. Serial No. 607,790. (No model.)

To all whom it may concern:

Be it known that I, FRANK C. HOYT, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Spring-Balance Computing-Scales; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in the dial and face-plate of a spring-balance computing-scale.

The object of the invention is to provide a dial which shall have the maximum capacity for indicating values of any article placed upon the scale-pan, at different rates, which will indicate said values plainly and in such manner that there is the minimum danger of error in reading the indications.

The invention consists in the construction and combination of the dial and face-plate, substantially as hereinafter described, and as definitely set forth in the claims.

In the drawings, Figure 1 is a front view of a spring-balance scale containing my invention, and Fig. 2 is a sectional view of the face-plate on line 2 2 of Fig. 1.

Referring to the parts by letters, A represents the dial, which is rotated, by suitable mechanism, in the direction of the arrow D, distances proportionate to the weight of any article which is placed upon the scale-pan.

B represents the face-plate, which is secured in front of the dial.

The dial is divided into any desired number of circular columns *a a'*. Each column contains figures which, when seen right side up through either of the sight-openings *b b'* in the face-plate, indicate the value in cents of the article upon the scale-pan at the rates indicated on said face-plate in line with the columns. Each column is divided by transverse lines a^2 into as many equal spaces as will equal the product of multiplying the associated rate per pound by the number of pounds which will cause the dial to make one complete revolution—in the present case ten. For example, the column which is associated with the rate of three cents is divided into thirty spaces, and the column which is associated with the rate of sixteen cents is divided into one hundred and sixty spaces. In all of the spaces are placed figures which increase by increments of one from the zero-mark entirely around the dial. Every figure therefore indicates the number of spaces in its column which it is removed from the zero-point. The figures in every other row are inverted with respect to the figures in the intermediate rows, and the zero-points in every other row are in a common line on one side of the dial, while the zero-points in the intermediate rows are in a common line on the opposite side.

The sight-openings *b b'* extend from near the center of the face-plate in opposite directions across the face of the dial. These sight-openings are a little wider than the height of the figures on the dial, wherefore one number in each column may be seen completely, even if it is not exactly in the center of the sight-opening, but they are not wide enough to show two complete numbers in any column.

When the scale is empty, the zero-line of the columns *a* is in line with the lower (reading) edge of the sight-opening *b* and the zero-line of the columns *a'* is in line with the upper (reading) edge of the sight-opening *b'*. The figures in columns *a* appear right side up on the right side of the center and inverted on the left side, while the figures in the columns *a'* are right side up on the left side of the center and inverted upon the right side.

Since each column contains figures representing every value in cents, from one cent to the total value of ten pounds at the indicated rate, the figures are small, and to make them more easy to read through the narrow sight-opening a plano-cylindrical magnifying-glass C is secured across said opening by the following construction: The parallel horizontal edges of the glass lie behind the horizontal edges of the sight-opening, the edges of said sight-opening being bent outward a little, but so much that the rear flat side of the glass will be in substantially the same plane as the rear side of the face-plate. The glass is held in this position by metal strips *c*, which are soldered or otherwise secured to the rear side of the face-plate. By this means of securing the glass across the sight-openings the

glass is brought as close to the dial as it can safely be placed, whereas if secured against the front side of the face-plate it would be removed from the dial a distance greater by the thickness of the face-plate. This may seem a small matter, but if the glass is not very close to the dial the figures appear indistinct and blurred when seen through the glass.

In order to make the reading of the indications on the dial as easy as possible, the sight-openings over the columns which show inverted figures are covered. This desired result may be attained in a variety of ways. For example, the under surface of the sight-glass on the right may be painted over the columns a', which contain the inverted figure on that side of the center, and the under surface of the opposite sight-glass may be similarly painted over the columns a. Any opaque paint may be used, but it is believed that a paint the color of the face-plate, generally white, is the best. Instead of paint the metal strips c may be so placed as to entirely cover the columns containing the inverted figures, or instead of cutting the sight-openings in the form of one long slot these openings might be made as a series of short slots over the proper columns. This last construction would probably be found the best if magnifying-glasses C were not used.

The figures on the face-plate below the sight-opening b and above the sight-opening b' indicate the rate per pound at which the figures in the corresponding columns indicate values.

On the outer part of the dial a circular column a^3 may be formed and divided to indicate weights, and this column may be read through a curved sight-opening b^3 in the face-plate.

I disclaim the invention described as follows, to wit: In a computing-scale, a dial having on its face two sets of concentric rows of figures, which rows respectively represent progressive values at different rates, the figures in one set of rows being inverted with respect to the other figures, and the rows of one set beginning in a common zero-line upon one side of the dial, while the rows of the other set begin in a common zero-line upon the opposite side of the dial, combined with a face-plate having two sight-openings on opposite sides of the center, the reading edge of one sight-opening having rate-indicating figures in line with the rows of value-indicating figures on the dial, which appear right side up through said sight-opening, the other sight-opening having on its reading edge other rate-indicating figures in line with the rows of value-figures, which appear right side up through said sight-opening, as I am not the first inventor thereof.

What I do claim, and desire to secure by Letters Patent, is—

1. In a computing-scale, the combination of a face-plate having sight-openings on opposite sides of the center, and rate-indicating figures adjacent to said sight-openings, with a rotatable dial divided into circular columns, each of which is divided by one set of radial lines into as many equal spaces as will equal the product of the associated rate-figure multiplied by the number of pounds which will cause one complete revolution of the dial, each of said spaces containing a figure indicating the number of spaces it is removed from the zero-point, the figures in alternate columns having their zero-points on opposite sides of the center of the dial, substantially as and for the purpose specified.

2. In a computing-scale, the combination of a rotatable dial having annular columns which contain value-indicating figures, the figures in alternate rows being inverted, with a face-plate having sight-openings on both sides of the center, and means for hiding on both sides of the center the columns which contain the figures which appear upside down, substantially as and for the purpose specified.

3. In a computing-scale, the combination of a rotatable dial having annular columns containing value-indicating figures, with a fixed face-plate having a long narrow sight-opening the edges of which are bent outward, and a plano-cylindrical magnifying-glass which projects through said sight-opening, and has its edges behind the outwardly-bent edges of the sight-opening, and retaining-strips, secured to the rear side of said face-plate, which hold the glass in place, substantially as and for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK C. HOYT.

Witnesses:
E. L. THURSTON,
E. B. GILCHRIST.

1898

(No Model.) 895 2 Sheets—Sheet 1

B. LYON.

COMPUTING SCALE OR BALANCE.

No. 600,837 Patented Mar. 15, 1898.

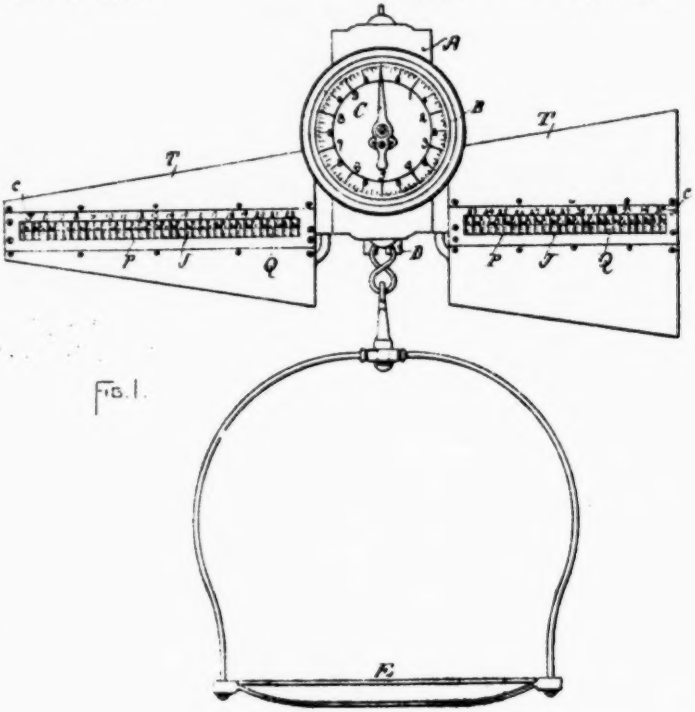

FIG. 1.

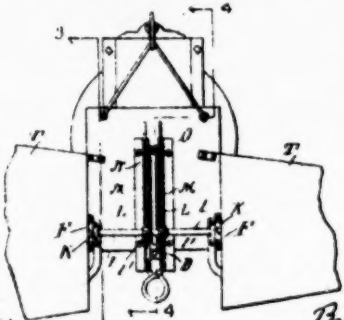

FIG. 2.

WITNESSES:
Harry J. Gaccon
Frank W. Brennan

INVENTOR:
Baxter Lyon
BY A. Sol. Schofield
ATTY.

(No Model.) 2 Sheets—Sheet 2

B. LYON.

COMPUTING SCALE OR BALANCE.

No. 600,837. Patented Mar. 15, 1898.

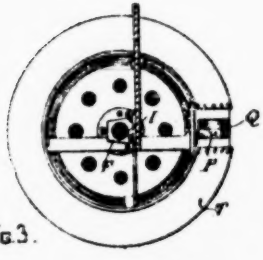

FIG. 3.

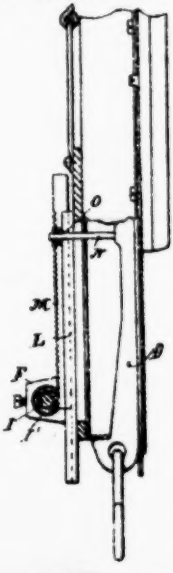

FIG. 4.

FIG. 10.

FIG. 7.

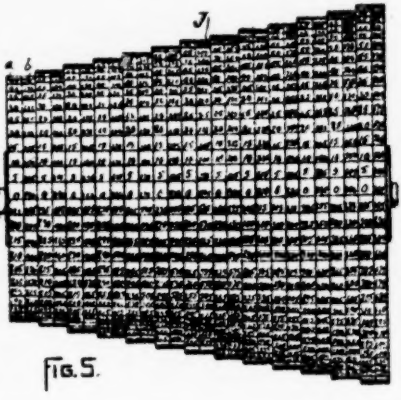

FIG. 5.

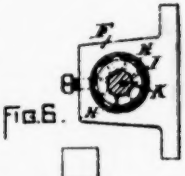

FIG. 6.

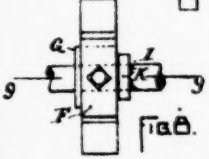

FIG. 8.

FIG. 9.

WITNESSES:

Harry J. Gannon

Lewis M Brennan

INVENTOR:

Baxter Lyon

BY S. Schofield

ATTY.

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899

UNITED STATES PATENT OFFICE.

BAXTER LYON, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO HIMSELF AND CHARLES R. BROMLEY, OF SAME PLACE.

COMPUTING SCALE OR BALANCE.

SPECIFICATION forming part of Letters Patent No. 600,837, dated March 15, 1898.

Application filed April 13, 1897. Serial No. 632,001. (No model.)

To all whom it may concern:

Be it known that I, BAXTER LYON, a citizen of the United States, residing at Providence, in the State of Rhode Island, have invented a new and useful Improvement in Computing Scales or Balances, of which the following is a specification.

The object of my invention is to provide a convenient computing scale or balance of simple construction adapted for ascertaining upon ready inspection the full price of the articles of merchandise weighed upon the scale; and it consists in the employment of a conical drum arranged in cylindrical steps, having graduations and numbers marked upon the cylindrical peripheries of the drum to indicate the full price of the article weighed, in connection with a series of figures representing the price per pound, and in the sliding universal joint between the indicating means and the weighing means.

In the accompanying drawings, Figure 1 represents a front view of a spring-balance provided with a computing-drum embodying my improvement. Fig. 2 represents a detail rear view. Fig. 3 represents a section taken in the line 3 3 of Fig. 2. Fig. 4 represents a detail section taken in the line 4 4 of Fig. 2. Fig. 5 represents an enlarged side view of the graduated drum upon which the figures which indicate the full price of the article to be weighed are marked. Figs. 6, 8, and 9 are detail views showing the ball-bearing for the shaft of the drum. Fig. 7 is a detail view showing the universal sliding-joint connection of the weighing mechanism with the sliding racks which serve to cause the rotation of the drum. Fig. 10 is an enlarged representation of the graduation and numeration of the computing-drum.

In the drawings, A represents the outer case of a spring-balance; B, the dial; C, the indicating-pointer, and D the pendent bar to which the weighing-pan E is attached. To the back of the outer case A are secured the ball-bearing brackets F F, which contain the bearing-sleeves G and the balls H H, the shaft I of the drum J J being provided with the collars K K, which revolve in contact with the balls H H and with the gears L, which engage with the racks M M. To the back of the case A are also secured the ways L L, which serve to guide the parallel racks M M, which are connected with the pendent bar D of the spring-balance by means of a universal sliding joint formed by the projecting stud N and the slot O, arranged between the said racks M M. The pendent bar D will thus be connected with the racks in such a manner that the loose vibrating movement of the pendent bar D will not affect the movement of the said racks. The drums J J are provided with an outer case or covering T, made in conical form and provided upon the front side with an elongated opening closed by a glass strip P, having the datum-line Q marked thereon. The drums J J are formed in cylindrical steps, having an ascending series of figures in two circumferential rows *a* and *b* marked thereon from the datum-line Q, which corresponds with the zero-point of the spring-balance, the said series of figures serving to represent the full price of the article which is being weighed.

Upon the conical outer cases of the drums J J are marked from the left to the right the ascending series of numbers "3," "6," "7," &c., which numbers represent the price per pound of the weighed article, the figures upon the drum at the datum-line Q under the said numbers serving to indicate the full price for the whole number of pounds weight at the represented rate per pound, the first turn of the pointer C of the spring-balance being represented by the left-hand circumferential row of figures *a* upon the drum and the second turn of the said pointer by the adjoining right-hand row of figures *b*, so that in all cases the full price for the number of pounds indicated by the spring-balance will be shown at the datum-line Q under the number in the series of figures *c*, which represents the price per pound, and upon inspection of the several position of the pendent bar D it can be readily seen how many times the hand or pointer C has passed around the dial.

The advantage of the arrangement of the surfaces of the drum in cylindrical steps consists in the greater facility for applying the graduations and in the distinctive separation of each of the graduated cylindrical surfaces by the annular rise between the said surfaces

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which serves to prevent error in reading the graduations, and the drum may be readily formed of cylindrical disks arranged side by side.

Having as my invention—

1. The combination of the weighing-balance, with a rotary computing-drum operatively connected with the balance, and having its surface arranged in cylindrical steps, which are graduated and notated to indicate the full price of the article weighed upon the balance, the fixed series of numbers representing the price per pound, and the fixed datum-line which corresponds with the zero-point of the balance, the annular rise between the cylindrical surfaces of the steps serving to distinctly separate the several scales of prices from each other upon the surface of the drum, substantially as described.

2. The combination of a weighing-balance, with a rotary computing-drum operatively connected with the balance, and having its surface arranged in cylindrical steps which are graduated and notated to indicate the full price of the article weighed upon the balance, the annular rise between the cylindrical surfaces of the steps serving to distinctly separate the scales of prices from each other on the surface of the drum, substantially as described.

3. In a computing-scale, the combination of the outer case, the dial, the indicating hand or pointer, and the pendent bar of a spring-balance, with the graduated and notated drums and drum-shaft, the racks and gears for operating the drums, and the stud-and-slot connection between the pendent bar and the racks, substantially as described.

BAXTER LYON.

Witnesses.
SOCRATES SCHOLFIELD,
JAMES W. BEUMAN.

1827

No. 12,137.

901

REISSUED JULY 28, 1903.

A. DE VILBISS, Jr.

SCALE.

APPLICATION FILED NOV. 16, 1901.

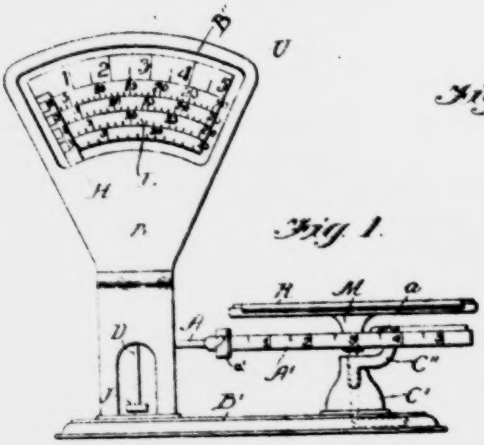

Fig 1.

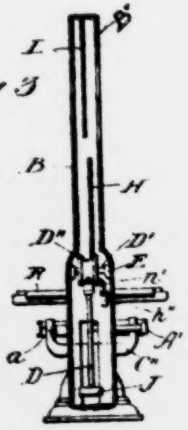

Fig 3

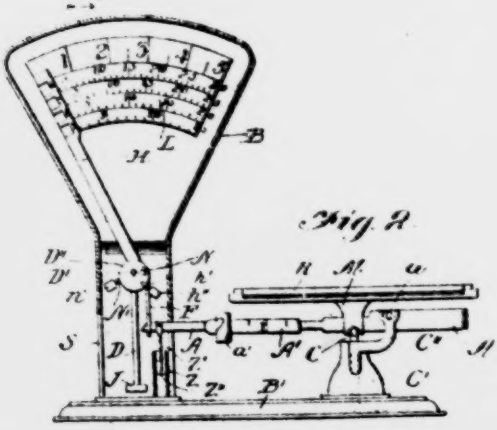

Fig 2.

WITNESSES:
Harold H. Bandt
Louis B. Erwin

INVENTOR
Allen De Vilbiss Jr.
By Rector & Hibben
His attys

1328

No. 12,137. 903 Reissued July 28, 1903.

UNITED STATES PATENT OFFICE.

ALLEN DE VILBISS, JR., OF TOLEDO, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO TOLEDO SCALE AND CASH REGISTER COMPANY, OF NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

SCALE.

SPECIFICATION forming part of Reissued Letters Patent No. 12,137, dated July 28, 1903.

Original No. 649,915, dated May 22, 1900. Application for reissue filed November 14, 1901. Serial No. 82,576.

To all whom it may concern:

Be it known that I, ALLEN DE VILBISS, Jr., a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Scales, of which the following is a description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to and has for its object the improvement of what are commonly known as "computing" or "price" scales, being scales which indicate not only the weight of the article or commodity being weighed, but also its value at any given rate per pound (or other unit of weight) within the capacity of the scale.

In the accompanying drawings, Figure 1 represents a front elevation of my improved scale; Fig. 2, a corresponding view with the housing or casing in section exposing the parts within, and Fig. 3 a vertical cross-section on the line 3 3 of Fig. 2.

The same letters of reference represent corresponding parts in the several views.

B represents a housing or case of suitable shape secured upon the base B', near one end thereof, and having its front side or wall provided in its upper portion with an opening B'', through which is exposed to view the price-computing table L, secured within the housing. Coöperating with this table is the upper end of an index-hand H, whose lower end is rigidly secured to a disk D'', provided upon its opposite sides with knife-edge projections D', resting in suitable bearings E upon the front and rear walls of the housing, Figs. 2 and 3. Rigidly secured to and depending vertically from the under side of the disk D'' is a pendulum D, provided with a weight J at its lower end. The index-hand H projects from the disk D'' at an angle to the pendulum D, so that when the latter hangs in its normal vertical position the upper end of the index-hand will extend across the left-hand end of the computing-table L, as shown, and when the lower end of the pendulum is swung to the left the upper end of the hand H will be moved to the right over the table L. The housing B is provided with an opening S in its left side, Fig. 2, through which the pendulum may swing.

Mounted upon the base B' near its right-hand end is a scale-beam support C', provided with two divergent supporting-arms C'', whose upper ends are suitably shaped to form supporting-bearings for knife-edge projections *a* on the scale-beam A, Figs. 2 and 3. The scale-beam A is forked or formed of two opposite members at its right-hand end embracing the supporting-arms C'', as shown, while at its left-hand end it extends through a vertical opening in the right-hand side wall of the housing B and has connected to it the lower end of a link F, whose upper end is connected to the disk D'' at a point on one side of and above the pivotal support D' of said disk, the disk in the present instance being provided with a projecting knife-edge or pivot N, over which hooks the upper end of the link F.

Supported upon the scale-beam A by knife-edge bearings C, at a point to the left of but adjacent the fulcrum-support *a* of said beam, is the standard M of the scale-platform (or pan) R, said platform in addition to being supported upon the scale-beam A being guided in its vertical movements and held from lateral displacement by the usual means within the support C. (Shown in the dotted lines in Figs. 1 and 2.)

As will be understood from the above-described construction, when the article or commodity which is to be weighed and whose value is to be computed is placed upon the platform R its weight will tend to depress the left-hand end of the scale-beam A, and thereby through the connection of said beam with the disk D'' by the link F to swing the pendulum D to the left from its normal vertical position and move the upper end of the index-hand H to the right over the computing-table L, the weight and leverage of the pendulum serving to automatically counterbalance the weight of the article placed upon the platform and cause the index-hand to come to rest at a point upon the table L determined by the weight of such article. This table L is curved in the arc of a circle concentric to the pivotal support of the index-

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hand H and is provided with a plurality of curved lines separating it into a plurality of curved spaces, of which five are in the present instance shown in the drawings. The uppermost one of said spaces (marked U) is graduated and numbered to indicate units of weight and fractions thereof—in the present instance pounds and half-pounds from one to five. The remaining spaces are graduated and numbered to indicate the values of different articles or quantities of commodities at different prices per pound. Thus the lowermost one of said spaces is graduated and numbered to indicate the value of any given quantity (up to five pounds) at three cents per pound, the next space the same at four cents per pound, the next space at five cents per pound, and the uppermost one of the four spaces at six cents per pound. These prices per pound are indicated by numbers placed upon the index-hand H in line with the respective curved spaces mentioned, and the construction and adjustment and cooperation of the several parts of the scale are such that when the hand H is swung to the right over the table L to any given point by the weight of the article or commodity placed upon the platform R the value of such article at any of the prices per pound indicated upon the index-hand H will be shown in the corresponding curved space upon the table L at a point immediately adjacent said hand, while its weight will be shown in the uppermost curved space U. In the present instance the hand H is provided with a series of notches or openings adjacent the respective numbers upon it, through which the graduations and numbers upon the table L may be read.

For the purpose of counterbalancing the weight of the index-hand H the disk D″ is provided upon its side opposite said hand with a projecting screw h′, upon which is mounted an adjustable counterbalancing-weight h″, while to counterbalance the weight of the link F the disk D″ is provided at a point diametrically opposite the link-pivot N′ with a second projecting screw N″, upon which is mounted an adjustable counterbalancing-weight n′.

To permit commodities to be weighed in receptacles placed upon the platform R and their weight and value to be properly indicated upon the computing-table notwithstanding the additional weight of such receptacles, I provide the main scale-beam A with a tare-beam A′, upon which is mounted a tare-poise a′. This tare-beam is made of considerable length, extending beyond the fulcrum of the main beam, as shown in Fig. 1, in order to afford a large space for each unit of weight and in the present instance is graduated and numbered to indicate pounds and half-pounds from one to five to correspond with the graduations in the space U on the table L. When the tare-poise a′ is in its left-hand or normal position, Figs 1 and 2, the main scale-beam is exactly balanced and the index-hand H rests in the position shown upon the computing-table L. When a receptacle is placed upon the platform R preparatory to placing something in said receptacle to be weighed, the left-hand end of the scale-beam A will be depressed by the weight of such receptacle and the index-hand H swung to the right over the table L, indicating the weight of such receptacle in the space U; but by then sliding the tare-poise a′ to the right along the tare-beam A′ to a point or gradnation corresponding to such weight-indication the main scale-beam may be again balanced and the index-hand H brought back to normal position at the left-hand end of the computing-table, whereupon the commodity to be weighed in the receptacle may be placed in the latter and its weight and value be read upon the computing-table in the same manner as if it were placed directly upon the platform R.

To arrest the vibrations of the scale-beam A, and consequently of the index-hand H, and cause the latter to speedily come to rest at the proper point upon the table L after the article to be weighed has been placed upon the platform R, or after the poise a′ has been adjusted upon the tare-beam A′, I provide a dash-pot-arresting device comprising an upright dash-pot or cylinder Z, located within the base of the housing B and containing oil or other suitable fluid, in which moves a piston Z″, whose rod Z′ is connected at its upper end to the scale-beam A adjacent the point of connection of the latter with the lower end of the link F, as shown in Fig. 2.

As will be understood from the foregoing description, the operation of weighing and computing the value of any article or commodity which may be placed directly upon the platform R (or in the usual scale pan or scoop which may be substituted for said platform) consists simply in placing such article or commodity upon said platform, whereupon both its weight and value will be instantly and automatically indicated upon the computing-table L, while if the commodity to be weighed requires a special receptacle for it upon the scale-platform the weight of such receptacle may be first counterbalanced by means of the poise upon the tare-beam, whereupon the placing of the article or commodity in said receptacle will cause its weight and value to be at once automatically indicated upon the computing-table. Likewise if instead of employing the scale to indicate the weight and value of a given article or a given quantity of any commodity it be desired to employ it for the purpose of weighing out the proper quantity of a commodity to be furnished for a given amount of money at a given rate per pound it is simply necessary to place upon the scale-platform a sufficient quantity of such commodity to move the index-hand H over the table L until it reaches the graduation indicating such amount of money in the particular curved space corresponding to the

given rate per pound. In both cases the weighing and computing operation is entirely automatic, simply requiring the placing of the article or commodity upon the scale-platform.

Having thus described my invention, I claim—

1. In a computing-scale, the combination of a price-computing table L provided with the graduations and numbers indicating the value of different quantities of commodities at different prices per pound, the index-hand H pivoted at one end and cooperating at its opposite end with the table L and provided with the series of numbers indicating prices per pound, the vertically-depending weighted pendulum D connected at its upper end with the index-hand H and moving in unison therewith, a single scale-beam A fulcrumed near its outer end upon a suitable support at *a* and having its inner end connected with the index-hand H and pendulum D by the link F, and the platform R supported entirely upon said single beam A between the fulcrum *a* and the link F; substantially as described.

2. In a computing-scale, the combination of the price-computing table L provided with the graduations and numbers indicating the value of different quantities of commodities at different prices per pound, the index-hand H pivoted at one end and cooperating at its opposite end with the table L and provided with a series of numbers indicating different prices per pound, the vertically-depending weighted pendulum D connected at its upper end with the index-hand H and moving in unison therewith, a single scale-beam A fulcrumed near its outer end upon a suitable support at *a* and having its inner end connected with the index-hand H and pendulum D by the link F, the platform R supported entirely upon the single beam A between its fulcrum *a* and the link F, the dash-pot Z and the piston Z'' moving therein and having its rod Z' connected to a moving part of the scale mechanism, substantially as and for the purpose set forth.

3. In a computing-scale, the combination of the price-computing table L provided with the graduations and numbers indicating the value of different quantities of commodities at different prices per pound, the index-hand H pivoted at one end and cooperating at its opposite end with the table L and provided with the series of numbers indicating different prices per pound, the vertically-depending weighted pendulum D rigidly connected at its upper end with the index-hand H and moving in unison therewith, the scale-beam A fulcrumed near its outer end upon a suitable support at *a* and having its inner end connected with the index-hand H and pendulum D by the link F, the platform R mounted on the beam A between its fulcrum *a* and the link F, the tare-beam A' carried by the scale-beam A in front of and parallel with the same, and the poise *a'* mounted on said tare-beam, substantially as and for the purpose described.

4. In a computing-scale, the combination of the price-computing table L provided with the graduations and numbers indicating the value of different quantities of commodities at different prices per pound, the index-hand H pivoted at one end and cooperating at its other with the table L and provided with the series of numbers indicating different prices per pound, the weighted pendulum D rigidly connected at its upper end with the index-hand H and moving in unison therewith, the scale-beam A fulcrumed near its outer end upon a suitable support at *a* and having its inner end connected with the index-hand H and pendulum D, the platform R mounted on the beam A between its fulcrum *a* and the link F, the tare-beam A' carried by the scale-beam A, the poise *a'* mounted on said tare-beam, the dash-pot Z, and the piston Z'' moving therein and having its rod Z' connected to the scale-beam A for arresting the vibration of the scale-beam after movement of the poise *a'* upon the tare-beam and also after the placing of the commodity to be weighed upon the platform or in the receptacle thereon; substantially as described.

5. In a computing-scale, the combination of a price-computing table L provided with graduations and numbers indicating the values of different quantities of commodities at different prices per pound, the disk or hub D'' provided with the knife-edge trunnions D' projecting from its front and rear sides and resting in supporting-bearings E, the index-hand H rigidly secured at its lower end to the disk D'' and at its upper end cooperating with the table L and provided with a series of numbers indicating prices per pound, the vertically-depending weighted pendulum D rigidly secured at its upper end to the disk D'', the link-pivot N carried by the disk D'' and normally standing at a point above the pivotal axis of the latter, means carried by the disk D'' for counterbalancing the weight of the index-hand H and link-pivot N, the scale-beam A fulcrumed near its outer end upon a suitable support at *a* and connected at its inner end with the link-pivot N by the link F, and the platform R mounted on the beam A between the fulcrum *a* and the link F; substantially as described.

6. In a computing-scale, the combination of a price-computing table L provided with graduations and numbers indicating the values of different quantities of commodities at different prices per pound, the disk or hub D'' provided with the knife-edge trunnions D' projecting from its front and rear sides and resting in supporting-bearings E, the index-hand H rigidly secured at its lower end to the disk D'' and at its upper end cooperating with the table L and provided with a series of numbers indicating prices per pound, the

vertically depending weighted pendulum D rigidly secured at its upper end to the disk D', the link-pivot N carried by the disk D' and normally standing at a point above the pivotal axis of the latter, means carried by the disk D' for counterbalancing the weight of the index-hand H and link-pivot N, the scale-beam A fulcrumed near its outer end upon a suitable support at *o* and connected at its inner end with the link-pivot N by the link F, the platform R mounted on the beam A between the fulcrum *o* and the link F, the dash-pot Z and the piston Z' moving therein and having the upper end of its rod Z' connected to the scale-beam A adjacent the link F; substantially as and for the purpose described.

7. In a computing-scale, the combination of a price-computing table L provided with graduations and numbers indicating the values of different quantities of commodities at different prices per pound, the disk or hub D' provided with the knife-edge trunnions D' projecting from its front and rear sides and resting in supporting-bearings E, the index-hand H rigidly secured at its lower end to the disk D' and at its upper end cooperating with the table L and provided with a series of numbers indicating prices per pound, the vertically depending weighted pendulum D rigidly secured at its upper end to the disk D', the link-pivot N carried by the disk D' and normally standing at a point above the pivotal axis of the latter, means carried by the disk D' for counterbalancing the weight of the index-hand H and link-pivot N, the scale-beam A fulcrumed near its outer end upon a suitable support at *o* and connected at its inner end with the link-pivot N by the link F, the platform R mounted on the beam A between the fulcrum *o* and the link F, the tare-beam A' mounted on the scale-beam A, and the poise *a* mounted on said tare-beam; substantially as and for the purpose described.

8. In a computing-scale, the combination of a price-computing table L provided with graduations and numbers indicating the values of different quantities of commodities at different prices per pound, the disk or hub D' provided with the knife-edge trunnions D' projecting from its front and rear sides and resting in supporting-bearings E, the index-hand H rigidly secured at its lower end to the disk D' and at its upper end cooperating with the table L and provided with a series of numbers indicating prices per pound, the vertically depending weighted pendulum D rigidly secured at its upper end to the disk D', the link-pivot N carried by the disk D' and normally standing at a point above the pivotal axis of the latter, means carried by the disk D' for counterbalancing the weight of the index-hand H and link-pivot N, the scale-beam A fulcrumed near its outer end upon a suitable support at *o* and connected at its inner end with the link-pivot N by the link F, the platform R mounted on the beam A between the fulcrum *o* and the link F, the tare-beam A' mounted on the scale-beam A, the poise *a* mounted on said tare-beam, the dash-pot Z, and the piston Z' moving therein, and having the upper end of its rod Z' connected to the scale-beam adjacent the link F; substantially as and for the purpose set forth.

9. The herein-described computing-scale comprising the base B, the housing B mounted thereon near one end and provided in its upper portion with the opening B', the price-computing table L located within the housing B and exposed to view through said opening, the disk D' pivotally supported in the housing B, the index-hand H rigidly secured at its lower end to the disk D' and cooperating at its upper end with the price computing table L, the weighted pendulum D rigidly secured at its upper end to the disk D', the scale-beam support C C' mounted upon the opposite end of the base B from the housing B, the scale-beam A fulcrumed thereon at *o*, the link F connecting the opposite end of the beam A with the disk D', means on said disk for counterbalancing the weight of the link I and index-hand H, the platform R mounted on the beam A between its fulcrum *o* and the link F, the dash-pot Z and the piston Z' moving therein and having the upper end of its rod Z' connected to the beam A adjacent the link F; substantially as described.

10. In a scale, the combination with the central pivot, a disk mounted thereon and having a pendulum hanging normally vertical, and an index standing normally oblique, a link-pivot connected with this disk and at a point normally above said central pivot, a screw projecting from the disk opposite the link-pivot and a counterbalancing-weight adjustable on this screw; of a table with which the index coacts, a beam mounted on a fulcrum, a pan or platform, and a link connecting said beam with the link-pivot, all substantially as and for the purpose set forth.

11. In a scale, the combination with the housing having bearings, a disk having a central pivot mounted therein, a pendulum hanging normally vertical from the disk, an index standing normally oblique to this pendulum, a link-pivot connected to the disk and normally above its central pivot, screws projecting from the disk, and counterbalancing-weights adjustable on said screws; of a beam mounted on a fulcrum, a pan or platform, and a link connecting the beam with the link-pivot, all substantially as described.

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Witnesses.
HENRY THEOBALD,
EMMA EIDEN.

1332

No. 874,883. 907 Patented May 28, 1901.

A. U. SMITH.

WEIGHT AND PRICE INDICATING SCALE.

(Application filed Mar. 9, 1900.)

(No Model.) 6 Sheets—Sheet 1.

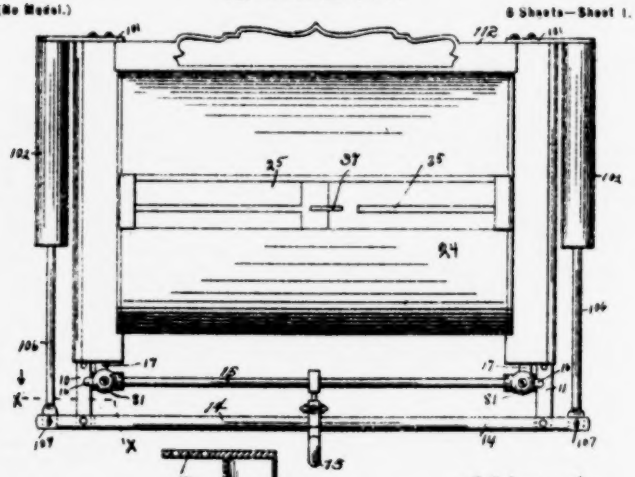


Fig. 1.

Fig. 2.

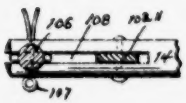


Fig. 3.

Witnesses:

H. E. Hooker

L. D. Miller

Inventor:

Albert U. Smith

By Dale Carlton

his Atty

1333

909

No. 674,883. Patented May 28, 1901.

A. U. SMITH.

WEIGHT AND PRICE INDICATING SCALE.

(Application filed Mar. 9, 1900.)

(No Model.) 6 Sheets—Sheet 2.

Fig. 4.

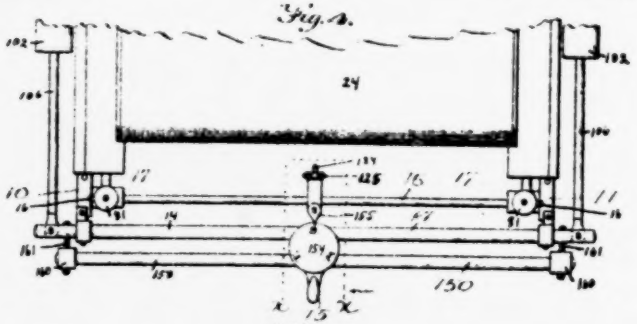


Fig. 5.

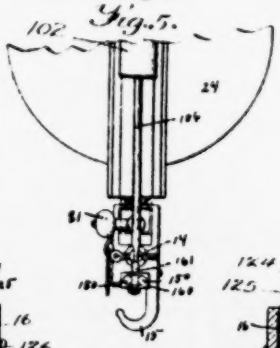


Fig. 9.

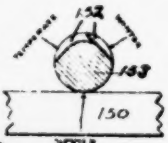
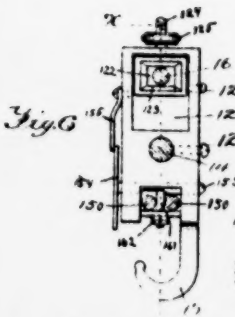


Fig. 6



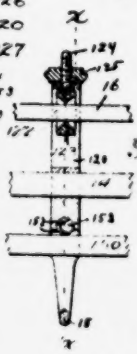


Fig. 8.

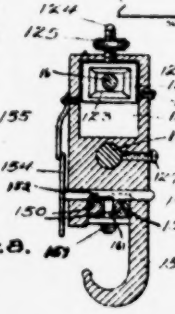


Fig. 7.

Witnesses:
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L. D. Keller.

Inventor
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No. 674,883. **911** Patented May 28, 1901.

A. U. SMITH.

WEIGHT AND PRICE INDICATING SCALE.

(Application filed Mar. 9, 1900.)

(No Model.) 8 Sheets—Sheet 3.

Fig. 10.

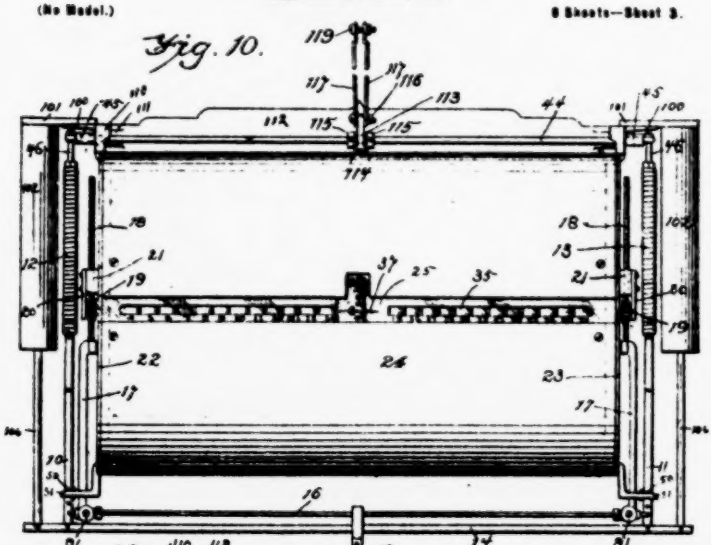


Fig. 10½.

Fig. 11½.

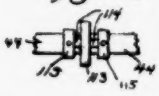
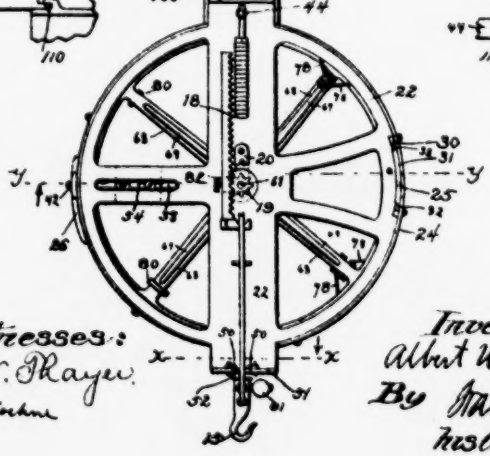


Fig. 11.



Witnesses:
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No. 674,883. Patented May 28, 1901.

A. U. SMITH.

WEIGHT AND PRICE INDICATING SCALE.

(Application filed Mar. 9, 1900.)

No Model.) 6 Sheets—Sheet 4.

Fig. 12.

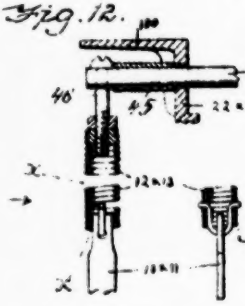


Fig. 13.

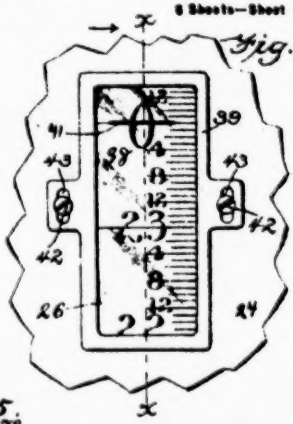
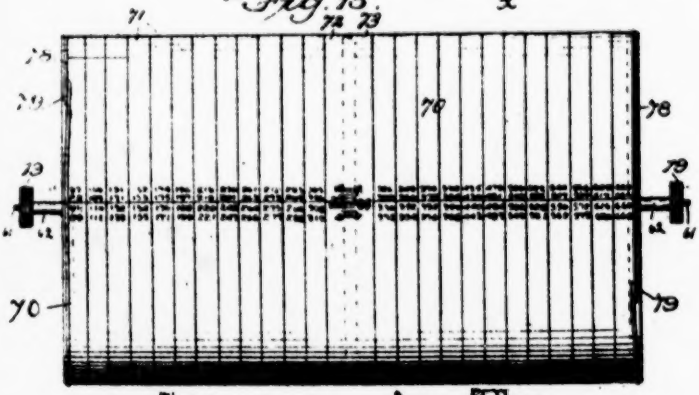


Fig. 14.

Fig. 15.



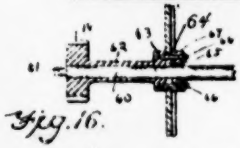


Fig. 16.

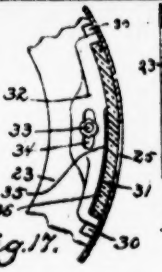


Fig. 17.

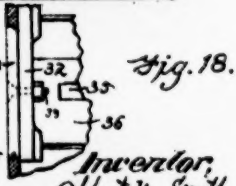


Fig. 18.

Witnesses:
H. W. Phaye
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1336

No. 674,883. **915** Patented May 28, 1901.

A. U. SMITH.

WEIGHT AND PRICE INDICATING SCALE.

(Application filed Mar. 9, 1900.

(No Model.) 6 Sheets—Sheet 5.

Fig. 19.

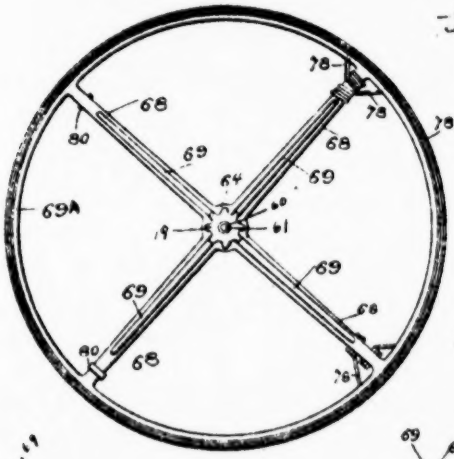

Fig. 20.

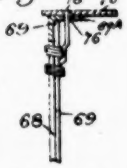

Fig. 21.

Fig. 22.

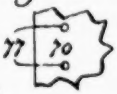

Fig. 23.

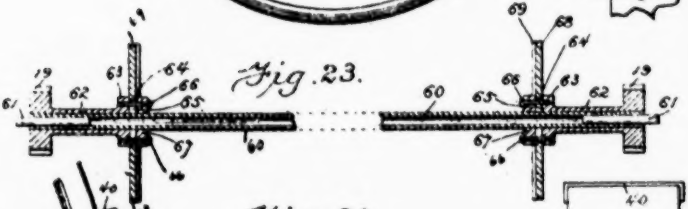

Fig. 24.

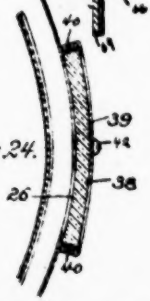

Fig. 25.

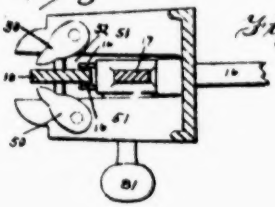

Fig. 26.

Witnesses:
H. W. Shayer
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1337

917

No. 674,883. Patented May 28, 1901.

A. U. SMITH.

WEIGHT AND PRICE INDICATING SCALE.

(Application filed May 6, 1900.

(No Model.)

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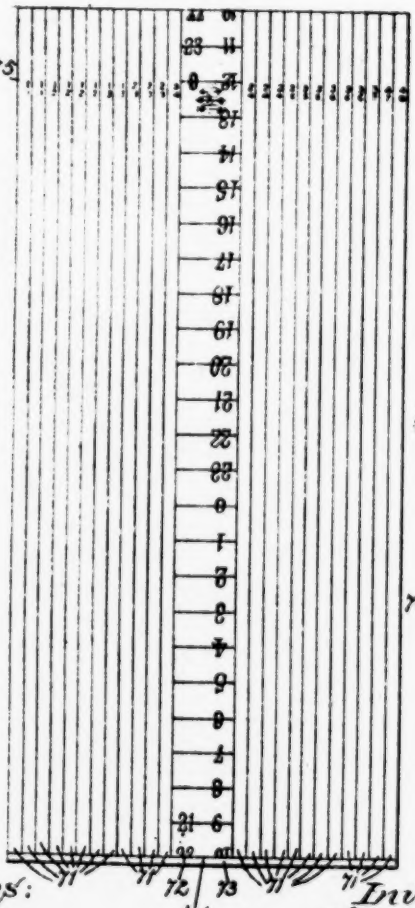
Fig. 27.

Fig. 28.



Witnesses:

L. D. Miller.

Inventor:
Albert U. Smith

By Mole, Forbes & Co.
his Attys

1338

919

UNITED STATES PATENT OFFICE.

ALBERT U. SMITH, OF SAUGATUCK, CONNECTICUT, ASSIGNOR TO THE COMPUTING SCALE COMPANY, OF DAYTON, OHIO.

WEIGHT AND PRICE INDICATING SCALE.

SPECIFICATION forming part of Letters Patent No. 674,883, dated May 28, 1901.

Application filed March 9, 1900. Serial No. 8,021. (No model.)

To all whom it may concern:

Be it known that I, ALBERT U. SMITH, of Saugatuck, county of Fairfield, and State of Connecticut, have invented a certain new and useful Improvement in Weight and Price Indicating Scales; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like numerals refer to like parts.

This invention relates to improvements in weight and price indicating scales in general, and specifically to that class illustrated in my Letters Patent No. 545,616, of April 3, 1895, reissued, No. 11,536, April 28, 1896, as well as in my Letters Patent No. 597 300, dated January 11, 1898.

My present invention has for its object the providing of means applicable to all scales employing springs for adjustment of the mechanism of said spring or springs to compensate for the variations in temperature. So far as I am aware I am the first in the art to devise, construct, and use such means or mechanism, and the broader claims thereon are not to be restricted in their scope to any particular or specific form of apparatus, but to all forms embodying means for adjusting the mechanism or the spring to compensate for the different degrees of temperature, however widely they may differ in construction.

In the drawings, Figure 1 illustrates a front elevation of a scale embodying my invention. Fig. 2 is an enlarged central vertical sectional view of one of the draft-bars and indicator-controllers. Fig. 3 is an enlarged sectional plan view on line X X of Fig. 1. Fig. 4 is a front elevation of the lower portion of the scale shown in Fig. 1, having added thereto the means for accommodating the mechanism and springs to different degrees of temperature. Fig. 5 is an end view of the parts shown in Fig. 4. Fig. 6 is an enlarged elevation on line X X of Fig. 4. Fig. 7 is a sectional view on line X X of Fig. 8. Fig. 8 is a sectional view on line X X of Fig. 6. Fig. 9 is a diagrammatic enlarged front sectional view of the cam and spring bars of the means for accommodating the mechanism to different degrees of temperature. Fig. 10 is a front view of a scale similar to Fig. 1, but having the end covers of the casing removed and having the front top plate removed to expose the supporting-rod at the top of the scale. Fig. 10½ is a top plan view of one end of the scale-casing with the controller removed. Fig. 11 is a side elevation of Fig. 10 with the end controller removed and the front top plate added. Fig. 11½ is an enlarged bottom plan view of the scale-suspending means. Fig. 12 is a central vertical sectional detail view of a portion of the spring and its supporting and connecting means. Fig. 13 is a sectional view on line X X of Fig. 12. Fig. 14 is an enlarged front elevation of the exposing-opening, through which only the weight of the load is indicated, the adjacent portion of the casing being broken away. Fig. 15 is a plan view of the indicator-drum. Fig. 16 is a sectional detail view of one end of the spindle of the indicator-drum, showing the pinion and the manner of securing said pinion to said drum. Fig. 17 is a sectional side elevation in detail of a portion of the end frames and outer casing, showing the means for adjustably mounting the glass over the opening that exposes the weights and prices of the loads. Fig. 18 is a side elevation of the parts shown in Fig. 17 looking from the left. Fig. 19 is an end view of the indicator-drum. Figs. 20, 21, and 22 illustrate details of construction thereof. Fig. 23 illustrates a central vertical sectional view through the indicator-spindle, the central portion thereof being broken away. Fig. 24 is a reduced sectional side elevation on line X X of Fig. 14. Fig. 25 is an enlarged sectional plan view on line X X of Fig. 11. Fig. 26 is a front elevation of the glass employed in the indicator shown in Figs. 24 and 14. Fig. 27 is a sectional view, on line Y Y of Fig. 11, of the end-frame casting; and Fig. 28 is a plan view of the flat sheet which is rolled to form the periphery of the indicator-drum.

The general construction and operation of the scale are set forth in the aforesaid Letters Patent, and it is unnecessary to say more about the parts of said scale set forth in the aforesaid Letters Patent than that 10 and 11 indicate the draft-bars, respectively connected to springs 12 and 13, the lower ends of said draft-bars 10 and 11 being connected to the

opposite ends of a horizontal bar 14, having a weight-receiving hook or member 15, rigidly secured at the center of its length intermediate said draft-bars 10 and 11. Parallel with said bar 14 is a supplemental bar 16, preferably bifurcated at its opposite ends to engage said draft-bars 10 and 11, said bar 16 being loosely engaged by a projection of said hook or member 15. Pivotally mounted near the ends of the said bar 16 are vertical arms 17, having racks 18 upon their upper ends meshing with pinions 19, secured to the spindle of the indicator-cylinder, provided with revoluble bearings in projections 20, removably attached to lugs 21 upon each of the rear end frames 22 and 23, Figs. 10, 11, and 27, said end frames 22 and 23 having their peripheries connected to opposite ends of a cylindrical casing 24, provided with a slot 25 in its front face extending substantially the length of the indicating-cylinder for exposing the weights and prices of loads and with a relatively narrow exposing-opening 26 in the rear face thereof for exposing to view only the weight of loads suspended from the hook or receiver 15.

I will now proceed to describe the points, constructions, and combinations of novelty possessed by my present invention.

The periphery of each of the end frames 22 and 23, adjacent the slot 25, is provided with an arc-shaped recess 30, in which is mounted an arc-shaped strip of glass or other transparent material directly beneath and covering said opening 25. Said glass portion 31 is less in width than the extent of said slots 30 and is secured at a desirable point in said slots 30 by means of substantially U-shaped portions 32, Figs. 11, 17, and 18, and being arc-shaped to embrace said glass portion 31 between its arms, said portion 32 being secured in the instance shown to the inner edge of each of the end frames 22 and 23 by a screw or bolt 33, secured to one part and engaging in a slot 34 in the other part, said bolt 33 and slot 34 being adapted to permit the adjustment of said portions 32, so that said glass portion 31 will occupy different positions in said slots 30, so that the character-designating means upon said glass portion 31 may be adjusted to designate the character or characters indicating the true weight or value. Said character-designating means consists in the instance shown of a slot 35, Figs. 10, 17, and 18, formed through paper or other opaque material 36, secured to the inner face of the glass portion 31, said slots 35 extending over all the characters indicating the price of articles at different rates per unit, while a designating line or pointer 37, Figs. 1 and 10, also secured to said glass, projects over and serves to designate the weight-indicating characters exposed through said glass 31. The exposing-opening 26 is covered by an arc-shaped glass 38, mounted in an arc-shaped frame 39, with strips 40 of cushioning material interposed between the edges of said glass 38 and said frame 39, Figs. 21 and 26, to prevent the breakage of said glass 38, while said glass is provided with a designating line or pointer 41, adapted to designate the correct weight indicating characters indicated through said glass 38, and said line or pointer 41 is adapted to be adjusted by the adjustment of the frame 39, in which glass 38 is mounted, said adjustment being by means of screws 42 passing through slots 43 in said frame 39 and into the casing 24. (See Figs. 14, 24, and 26.)

The end frames 22 and 23 are loosely pivoted at or near their tops upon a rod 44, having collars 45 thereon intermediate said end frames 22 and 23 and the projections 46, passing loosely through the ends of said shaft 44 and securing the springs 12 and 13 to said rod 44, so that said frames 22 and 23 are loosely suspended from said rod 44, as are also the springs 12 and 13 from a different point on said rod 44, so that the entire scale-casing, composed of the end frames 22 and 23, and the cylinder 24 and the parts secured thereto are perfectly free to vibrate upon their suspending-rod 44 as a pivot, which vibration is limited by projections 50, Figs. 10 and 25, adjustably mounted upon extensions 51 at the bottom of each of said frames 22 and 23, said projections 51 being each provided with a vertical slot 52 for the accommodation of the draft-bars 10 and 11 and the upright bars 17. Projections 50 preferably have pointed ends adjustable toward said draft-bars 10 and 11 for the purpose of limiting said vibration of said scale-casing. (See Figs. 10, 11, and 25.) For the purposes of securing the proper adjustment of the vertical gravity-plane of the end frames 22 and 23 and the parts swinging therewith readily and without undue skill or manipulation, so that said parts can be manufactured in quantities and then be adjusted so that said vertical gravity-plane of said parts will pass through the center of the length as well as of the width of their suspending-rod 44, the center of said indicating-cylinder and springs 12 and 13, and the center of said rods 14 and 16, I provide either or both of said end frames 22 and 23 with a slot or guide 53, Figs. 11 and 27, at an angle to said gravity-plane, and in said guide or slot 53 of each of said frames 22 and 23 I adjustably mount a weight 54, the adjustment of which closer to or farther from the said vertical gravity-plane correspondingly adjusts said vertical gravity-plane until it is in the correct position, where the weight of the parts on each side of said vertical gravity-plane will be identical and no friction will be caused between the portions 50 and the draft-bars 10 and 11, or either of them, and by independently suspending the springs and the casing from the same pivotal point the objection due to the load upon the springs vibrating and causing the casing and draft-bars to bind in structures where the springs are suspended from the casing is obviated.

The indicating-cylinder is formed with a spindle 60, which may be either a thin rod or tube, but preferably a tube, as shown in Fig. 23, provided with bearings 61 at opposite ends of reduced diameter, and where said spindle 60 is formed of a thin tube said end bearings 61 are formed of pins driven into the opposite ends of said tube. The pinions 19 are driven onto or otherwise secured to the opposite end of said spindle 60 and are provided with hubs 62, having flanged end projections 63 fitting against webs 64, provided with slots 65, through which pass screws 66 to confine said webs 64 between the face of said collars 63 and a washer 67, Figs. 16 and 23. Said webs 64 are formed of an equal number of thin light arms 68, each having a rib 69 extending substantially its length, and said arms 68 are connected at their outer ends to a substantially L-shaped periphery 69', Figs. 19 and 20. Upon the periphery of and extending between said portions 69' and rolled into the form of a cylinder is a sheet of paper or other light material 70, which when absorbent is preferably coated on both sides with moisture-resisting material, Figs. 15, 19, 20, and 28, and provided with a series of rows of characters 71, indicating the prices of loads at different rates per unit, and in the instance shown with two rows 72 and 73 of weight-indicating characters, the row 73 extending in the reverse direction to the row 72, and when rolled upon the peripheries of said portions 69' the rows 72 and 71 of characters are adapted to be indicated through the slot 25, while the row 73 of characters is adapted to be indicated through the slot 26 in the cylindrical casing 24. On one end of said sheet 70 is a strip 74, Fig. 28, in the instance shown provided with no graduations, so that the opposite end of said sheet 70 may overlap said strip 74 for the purpose of securing the opposite ends of sheet 70 together to form a cylinder. The zero-point or point of beginning for each of the rows 71 and 72 of characters is at the point indicated at 75 in Fig. 28, which is intermediate the opposite ends of said sheet 71 and that said row 73 of characters beginning at a point likewise intermediate the opposite ends of said sheet 70, which ends are joined together to form a cylinder at a point, in the instance shown in Fig. 28, twenty-two pounds removed from zero with respect to the rows of characters 71 and 72, so that should an inartistic joint be formed between the ends of said sheet 70 it will not be ordinarily exposed through the indicating slots or remain exposed through them, as is the case when such joint is formed at the zero-position. To secure said sheet 70 to the peripheries of said portions 69', I form openings 76 through the peripheries of each of said portions 69' in the instance shown, one opening on each side of the arms 68 thereof, and through said sheet 70 I form registering openings 77. As shown in Fig. 15, near or at the opposite ends of the cylindrical sheet 70 I wrap a coil of light fine wire 78, so as to bind the cylindrical sheet 70 near their opposite ends to the peripheries of said portions 69', the opposite ends of said wires 78 overlapping each other, as shown at 79 in Fig. 15, and passing through said registering openings 77 and 76 and coiled to the adjacent arms 68, as shown in Figs. 11, 19, and 20. As shown in said figures, the point at which the opposite ends of said wires 78 pass through the cylindrical sheet 70 and are wrapped about the adjacent arms 68 are at different points in the arc of the circle, so as to distribute the slightly-increased weight caused thereby, and to compensate for such increased weight and at the same time to form a means for adjusting the longitudinal center of gravity of said indicator to coincide with its axis of rotation I adjustably mount upon one or more of the arms 68 weights 80, Figs. 11 and 19, which weights 80 may be adjusted closer to or farther from the center of rotation of said indicating-cylinder to change its center of gravity to coincide with said axis of rotation, which adjustment may be made very readily and cheaply and enabling the indicating-cylinders and the parts thereof to be made in large quantities with the employment of only ordinary skill and at the same time enabling the adjustment of the center of gravity of said indicator readily by comparatively unskilled persons to coincide with its axis of rotation to enable it to be revolved upon its axis uniformly and without influencing the counterbalance members or springs 12 and 13. In the instance shown in the drawings said weights 80 are formed of bands of soft material surrounding said arms 68 and sliding thereon to correct said center of gravity when said weights 80 are adapted to be pinched or clamped by tweezers or other simple tool, so as to firmly bind against said arms 68 and be retained in position.

The uprights 17, pivotally mounted upon opposite ends of the rod 16 and having the racks 18 secured to the upper ends thereof, are provided with weighted arms 81, projecting from said pivotal point at substantially a right angle and in the direction toward which the teeth of the racks 18 face, (see Figs. 10, 11, and 28,) so that said weighted arms 81 cause said racks 18 to incline toward and keep at all times in engagement with the pinion 19 and out of engagement with the portion 82, Fig. 11, of projection 20 which extends behind each of said rack-bars 18 to prevent said rack-bars from moving out of mesh with their pinion 19.

The upper end of each of the end frames 22 and 23 is provided with a lateral extension 100, to each of which projections 100 is removably secured by screws or otherwise the lateral foot 101 of a downwardly-projecting open-mouthed tubular cylinder 102, Figs. 1, 4, 5, and 10. The vertical axes of said tubes 102 are in the same vertical plane with the counterbalance members or springs 12 and 13, the

[points of suspension of said springs or members and the scale-casing, and the point of connection of draft-bars 10 and 11 with rod 14, and the point of application of the load to the receiver or hook 15. In each of said tubes 102 is slidingly mounted a piston 103, provided with a circular recess 104 in their lower ends receiving the ball end 105 of connecting-rod 106, pivotally and removably connected at their lower ends by cotter-pins 107 or otherwise to the opposite ends of the rod 14, which opposite ends of said rod 14 are provided with a slot 108, in which the lower ends of said connections 106 and draft-bars 10 and 11 are pivotally mounted. The upward-and-downward movement of the bar 14 and its connected parts causes pistons 103 to move correspondingly upward and downward in said tubes or cylinders 102 to respectively compress and rarefy the air in said tubes 102 between said pistons 103 and the closed upper end or head of said cylinders 102 for the purpose of controlling and regulating the movement of the bar 14 and its connected parts and steadying the movement of the indicating-cylinder in driving connection with said rod 14. The inner faces of both of said projections 100 of the end frames 22 and 23 are provided on opposite sides with lugs 109, adapted to fit into slits 110, formed by L-shaped projections 111 at the opposite ends of the top, front, and back plates 112, Figs. 1, 10, 10½, and 11, which plates 112 are for the purpose of name-plates and to give a finished appearance to the scale and conceal ing the rod 14 from view, as shown in Fig. 1. In the center of the length of said rod 44 is mounted loosely thereon a vertical portion 113, provided on the under side of said rod 44 with projections 114, adapted to loosely engage collars 115, rigidly secured to said rod 44 on opposite sides of said portion 113 and adjacent the ends of the projections 114 for the purpose of enabling the upper end of said portion 113 to have a limited lateral movement between said collars 115 and at the same time prevent any lateral movement of said portion 113 at its point of contact with the bottom of said rod 44, so as to maintain at all times the vertical alinement between the point of contact of portion 113 against the bottom of rod 44 and the point of application of the load to the member or hook 15 and in the same plane with the axis of the tubes or controllers 102 and the springs or counterbalance members 12 and 13. To the upper end of portion 113 and on opposite sides thereof are secured by bolt 116 flexible strips 117, provided throughout their lengths with oppositely-located bolt-openings 118 for the reception of a bolt 119 to adjustably support said scale to a convenient point of support. As shown in Figs. 4, 5, 8, 7, and 8, the upper end of said hook or member 15 is provided with a vertical slot 120, in which is mounted to slide vertically a block 121, provided with a horizontal opening 122 therethrough, said opening 122 being provided with tapering edges 123 for loose contact with the rod 16. Through the top wall of said slot 120 is an opening, through which passes a screw 124, rigidly secured to the top of said block 121, on the upper end of which screw 124 is mounted a nut 125, adapted to engage with the upper end of said member or hook 15 to draw said block 121, with its rod 16, farther from or closer to the rod 14, as the case may be, for varying the position of the indicator with reference to the counterbalance members or springs 12 and 13, and through a side wall of said slot 120 is passed a screw 126, adapted to engage and clamp said block 121 in its adjusted position in said slot, while a screw 127 passes through said hook or member 15 to clamp the same to the center of said rod 14.

I will now proceed to describe the means I have employed in the instance shown in the drawings for adjusting the mechanism to compensate for variations due to changes in temperature, reference being had to Figs. 4, 5, 6, 7, 8, and 9. The bar 14 is a long relatively thin spring-bar pivotally connected near its opposite ends to the draft-bars 10 and 11 and having a load receiver or hook 15, rigidly secured in the center of its length intermediate the points of connection with said draft-bars 10 and 11 and loosely connected to the center of the length of the rod 16, on whose opposite ends are pivoted the indicator-driving uprights 17, all as aforesaid, and by reason of the sliding engagement between the opposite ends of said bar 16 and the meshing of the racks 18 with pinions 19, rigidly secured to the indicator-drum, said rod 16 at all times remains in a perfectly horizontal position at a distance from the center of the length of the bar 14 fixed by the position of the block 121 or by that portion of hook or member 15 which engages with said rod 16. When a load is suspended from the receiver or hook 15, the center of the spring-bar 14 yields downward a distance proportionate to the weight of said load, carrying bodily downward the horizontal rod 16 a like distance, which drives the indicator a proportionate distance, and by reason of the elongation of the springs 12 and 13 in counterbalancing said load said bars 14 and 16 are bodily moved downward a further distance, equal or proportionate to the elongation of said springs 12 and 13, and drive said indicator a further proportionate distance, so that, as is apparent from the foregoing, the spring-bar 14, transmitting the load to the springs or counterbalancing members 12 and 13, forms a part of said counterbalancing means in the instance shown in the drawings. When the temperature is cold, the springs expand less than when the temperature is warm, and said expansion increases as the temperature increases, and the means I have devised compensate for such variations, so that an accurate scale is obtained at any or-

dinary temperature. In the instance shown in the drawings said means for compensating for the aforesaid variations consists of one or more bars or members 150, connected at their opposite ends to the opposite ends of the bar 14, the center of said bars 150 passing loosely through a slot 151 in said member or hook 15 and is adapted to be engaged by a projection or projections 152 upon a shaft 153, provided with bearings in said hook or member 15. On the outer end of said shaft 153 is rigidly secured an indicator disk 154, marked with the different seasons—such as "Summer," "Winter," and "Temperate," as shown in Figs. 4 and 9, or with the correspondingly different degrees of temperature, as may be desired, which different seasons or degrees of temperature are adapted to be designated by a pointer 155, rigidly secured to said hook or member 15.

In the summer or at the highest temperature the cam 152 is adapted to contact with the centers of all the rods 150 to render the connection between the counterbalance members or springs 12 and 13 the most rigid and prevent almost wholly the spring of said rods 150 and 14, and the increased expansion of the springs or members 12 and 13 is compensated for by the reduction or elimination of the flexibility of said connection (rods 150 and 14) between said springs or members 12 and 13. As the temperature changes to temperate said cam 152 is set to render said connection intermediate said springs or members 12 and 13 less rigid. During winter said bars 150 hang loosely from said bar 14 and are not engaged by cam 152, which enables said bar 14 to add all its flexibility to the elongation of the springs in order to compensate for the reduced expansion of said springs to produce accurate results. In the specific structure shown in the drawings said rods 150 are two in number, arrayed side by side and having their opposite ends mounted in frames 160, secured to the ends of rod 14 by bolts 161, passing through said rods 14 and frames 160 and between said rods 150, while lock-nuts 162, Fig. 6, upon said bolts 161 maintain uniform distances apart the ends of said rods 14 and 150.

In summer or hot weather the periphery of shaft 153 is adapted to contact with the tops of both spring-bars 150, so that when an article to be weighed is suspended from hook or member 15 the load will be transmitted by the three spring-bars 14 and 150, acting together as one comparatively rigid bar to the load-counterbalancing members or springs, while in temperate weather only one of said spring-bars 150 is engaged by the periphery of shaft 153 by reason of the recess 152 therein, so that said bar 13 and one of said bars 150 add their elasticity to that of the counterbalance members or springs in counterbalancing the load, while in winter or cold weather the periphery of shaft 153 does not touch either of the bars 150 by reason of the two recesses 152 registering with and extending into each other, so that the spring-bar 14 will add all its elasticity to that of the counterbalancing members of springs in counterbalancing the load, and under each of the aforesaid conditions of temperature the degree of elasticity of the counterbalancing members or springs and said spring-bars is equal for a given load, which load is indicated by the indicator driven from the center of the length of said spring-bars 14 and 150, as aforesaid, so that the uniform elasticity may be communicated to the indicator at the point of greatest advantage, as if the indicator be driven from a point at the ends of said rod 14 the elasticity of said rods 14 and 150 will be unavailing. The ends of rods 16 are bifurcated and slide over the draft-bars 10 and 11 during the varying elasticities of said rod 14, aided by said spring-rods 150, as aforesaid.

It is perfectly obvious that if desired the disk 154 may be in the form of a designating-hand 155, rigidly secured to and revoluble with the shaft 153, and that numerous other alterations of the construction, form, and arrangement of the parts may be made without departure from the scope and spirit of this invention.

The cylinders 108, it will be observed, are removably attached outside of the other portions of the scale mechanism and, furthermore, that the lower ends of the piston-rods are connected with the bar 14, so as to be readily detachable therefrom. Thus said parts may be readily separated for cleaning, oiling, or repairing. The piston-rod may be separately detached from the draft mechanism, the piston drawn out, and the parts cleaned with the greatest facility without disturbing or disconnecting the other scale mechanism.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a scale, the combination of the load-counterbalancing springs, means for applying load to said springs, a spring-bar intermediate said load-applying means and said springs, an indicator, means for driving said indicator connected centrally to said spring-bar, and manually-adjustable means independent of the load for varying the degree of flexure of said spring-bar, substantially as specified.

2. In a scale, the combination of the load-counterbalancing springs, means for applying load to said springs, a spring-bar intermediate said load-applying means and said springs, an indicator, means for driving said indicator connected centrally to said spring-bar, and means including a manually-adjustable cam for varying the degree of flexure of said spring-bar, substantially as specified.

3. In a scale, the combination of the load-counterbalancing springs, means for applying load to said springs, a spring-bar intermediate said load-applying means and said

springs, an indicator, means for driving said indicator connected centrally to said spring-bar, means including a manually-adjustable cam for varying the degree of flexure of said spring-bar, and an indicator adjustable proportionate to said cam for indicating its proper adjustment at different temperatures, substantially as specified.

4. In a scale, the combination of the load-counterbalancing springs, means for applying load to said springs, spring-bars, an indicator, means for driving said indicator connected centrally to one of said spring-bars, and manually-adjustable means for varying the degree of flexure of said spring-bars for accommodating different temperatures; substantially as specified.

5. In a scale, the combination of the load-counterbalancing springs, means for applying load to said springs, a spring-bar, an indicator, means for driving said indicator connected centrally to said spring-bar, and a manually-adjustable cam for varying the degree of flexure of said spring-bar for accommodating different temperatures, substantially as specified.

6. In a scale, the combination of the load-counterbalancing springs, means for applying load to said springs, a spring-bar, an indicator, means for driving said indicator connected centrally to said spring-bar, means including a manually-adjustable cam for varying the degree of flexure of said spring-bar for accommodating different temperatures, and an indicator adjustable proportionate to said cam for indicating its proper adjustment at different temperatures, substantially as specified.

7. In a scale, the combination of the load-counterbalancing springs, means for applying load to said springs, an indicator, a driving connection between said indicator and said springs, manually-adjustable means for compensating for variations in the elongation of the springs under tension due to change of temperature to which said load-counterbalancing springs may be subject and an indicator for indicating the adjustment, substantially as specified.

8. In a scale, the combination of the load-counterbalancing springs, means for applying load to said springs, an indicator, a driving connection between said indicator and said springs, and means including a manually-adjustable cam for compensating for variation in the elongation of the springs under tension, due to change of temperature to which said load-counterbalancing springs may be subjected, substantially as specified.

9. In a scale, the combination of the load-counterbalancing springs, means for applying load to said springs, an indicator, a driving connection between said indicator and said springs, means including a manually-adjustable cam for compensating for variation in the elongation of the springs under tension, due to change of temperature to which said load-counterbalancing springs may be subject, and an indicator actuated by said cams for indicating the said adjustment of said cam, substantially as specified.

10. In a scale, the combination with the springs and rack-bars at opposite ends, a cylindrical indicator mounted between said springs and rack-bars at opposite ends, a bar between and connected to said springs, an independent bar between and connected to said rack-bars, said independent bar being loosely connected at its center to said first bar; means for applying load to said second bar; a third bar connected at its ends to said first bar; and adjustable means intermediate the ends of said first and third bars to cause said third bar to act or fail to act with said first bar, substantially as specified.

11. In a scale, the combination with the springs and rack-bars at opposite ends, a cylindrical indicator mounted between said springs and rack-bars at opposite ends, a bar between and connected to said springs, an independent bar between and connected to said rack-bars, said independent bar being loosely connected at its center to said first bar; means for applying load to said second bar; third and fourth bars connected at their ends to said first bar; and a manually-adjustable cam intermediate said first and third and fourth bars to cause said third bar and fourth bars to act or fail to act with said first bar, substantially as specified.

12. In a scale, the combination with the springs and rack-bars at opposite ends, a cylindrical indicator mounted between said springs and rack-bars at opposite ends, a bar between and connected to said springs, an independent bar between and connected to said rack-bars; said independent bar being loosely connected at its center to said first bar; means for applying load to said second bar; a third bar connected at its ends to said first bar; a manually-adjustable cam intermediate the ends of said first and third bars to cause said third bar to act or fail to act with said first bar, and an indicator for indicating the position of said cam, substantially as specified.

13. In a scale, the combination with the springs and rack-bars at opposite ends, a cylindrical indicator mounted between said springs and rack-bars at opposite ends, a bar between and connected to said springs, an independent bar between and connected to said rack-bars, said independent bar being loosely connected at its center to said first bar; means for applying load to said second bar; downwardly-projecting open-mouthed tubes at opposite ends of said scale with their longitudinal centers in the same vertical plane with said springs, pistons slidable in the bores of said tubes, pitmen pivotally connected at their upper ends to said pistons by means of balls formed upon the upper ends of said pitmen and bearing in sockets formed in the lower ends of said pistons, said pitmen being pivotally connected at their lower ends to the

opposite ends of said first bar, substantially as specified.

14. In a scale, the combination of a casing, a revoluble indicator therein, an adjustable exposing-opening for exposing the indications on said indicator, a weight-counterbalancing member in driving connection with said indicator, a support and independent connections loose with respect to each other, between said casing and said member and the support whereby said casing and said member may vibrate independently with the support as an axis; substantially as specified.

15. In a scale, the combination of a cylindrical casing, a cylindrical indicator revolubly mounted therein and provided with a series of peripherical rows of price indications, an adjustable exposing-opening for exposing said indications on said indicator, a load-counterbalancing member near each end of said casing and in driving connection with said indicator, a load-receiver connected to said counterbalancing members, and a member extending across the top of said casing and to which said casing and counterbalancing members are loosely with respect to each other and independently suspended and constituting an axis about which said casing and said counterbalancing member may vibrate independently; substantially as specified.

16. In a scale, the combination of a casing, suspension means therefor, an indicator mounted in said casing, a draft-bar movable proportionate to the load applied thereto, means for applying a load to said draft-bar, a driving connection between said draft-bar and indicator, said draft-bar projecting through a slot in said casing, and means for adjusting the center of gravity of said casing to remain in a plane passing through the plane in which are said suspension means for the casing and said means for applying a load to the draft-bar, substantially as specified.

17. In a scale, the combination of a casing, a suspension means therefor, an indicator mounted in said casing, a draft-bar movable proportionate to the load applied thereto, means for applying a load to said draft-bar, a driving connection between said draft-bar and indicator, said draft-bar projecting through a slot in said casing, and a weight mounted within said casing and adjustable at an angle to the direction of movement of said draft-bar for adjusting the center of gravity of said casing to obviate frictional contact between said casing and draft-bar, substantially as specified.

18. In a scale, the combination of a casing, suspension means therefor, an indicator mounted in said casing, a draft-bar movable proportionate to the load applied thereto, means for applying a load to said draft-bar, a driving connection between said draft-bar and indicator, said draft-bar projecting through a slot in said casing, and weights mounted within said casing and upon opposite sides of its center of gravity and adjustable at an angle to the direction of movement of said draft-bar for adjusting the center of gravity of said casing, substantially as specified.

19. In a scale, the combination of a casing, an indicator revolubly mounted therein and provided with a series of rows of characters indicating prices at different rates per unit, load-counterbalancing means within said casing, a driving connection between said load-counterbalancing means and said indicator, means for independently suspending said casing and said load-counterbalancing means, and a weight adjustably secured to said casing for adjusting the center of gravity of said casing, substantially as specified.

20. In a scale, the combination of an indicator consisting of a plurality of circular webbed frames, a sheet of light material provided with a coat of moisture-resisting material, a plurality of rows of price indications at different rates per unit and running lengthwise of said sheet, each of said rows of indications beginning at a point different from the meeting edges of said sheet, the meeting edges of said sheet being secured together when said sheet is rolled in the form of a cylinder about the peripheries of said frames, and bands passing around said peripheries of said frames, substantially as specified.

21. In a scale, the combination of a casing, a load-counterbalancing means and an indicator mounted therein, a driving connection between said counterbalancing means and said indicator extending through a slot in said casing and adapted to connect said load-counterbalancing means with a load, a weight adjustably mounted upon said casing for adjusting the center of gravity of said casing, and a weight adjustably mounted upon said indicator for adjusting the center of gravity of said indicator to coincide with its axis of rotation, substantially as described.

22. In a scale, the combination of a casing, an indicator mounted within said casing and counterbalancing means, a driving connection between said counterbalancing means and said indicator, an exposing-opening in said casing through which indications upon said indicator are exposed, an arc-shaped transparent member covering said exposing-opening, a frame in which said member is mounted, means for adjustably securing said frame to the casing, and means adjustable with said frame and said transparent member for designating which of the indications exposed through said exposing-opening are to be read for the true indication, whereby the adjustment of said frame and said transparent member correspondingly adjusts said designating means and corrects the indication, substantially as described.

23. In a scale the combination with a casing, a draft member, a drum-pulley journaled in the casing, counterbalancing springs located at opposite ends of the indicator axis and a connection between the draft member

and indicator whereby the indicator is rotated, of pneumatic dash-pot cylinders secured to the casing and located outside of the springs and in line with the axis of the drum, pistons in said cylinders and piston-rods detachably connected with the draft member; substantially as described.

24. In spring-scales, the combination with means for suspending the load, of counterbalancing-springs for the load-support and load, a regulating-spring connected therewith and means for regulating the flexure of said spring when load is applied and an indicator connected with the load-support; substantially as described.

25. In a scale embodying counterbalancing mechanism, and a load-support, the combination of a drum having computations of value thereon and formed of circular frames, a central spindle on which they are mounted, a sheet of flexible material on which the computations are marked, surrounding said circular frames and securing-bands passing around the flexible sheet and having their ends passed through the sheet and secured to the circular frames; substantially as described.

26. In a scale embodying counterbalancing mechanism and a load-support, the combination of a drum having computations of value thereon and formed of circular frames, a central spindle on which they are mounted, a sheet of flexible material on which the computations are marked, surrounding said circular frames in the form of a cylinder with registering openings in the sheet and peripheries of the frames and flexible bands passing around the cylinder and having their ends passed through the registering apertures and held within the cylinder; substantially as described.

27. In a scale, the combination of a casing, a cylindrical indicator within said casing and consisting of a shaft mounted in bearings within said casing, a plurality of light circular frames secured to said shaft, a sheet mounted upon the peripheries of said frames and having a plurality of peripherical rows of different indications, an exposing-opening extending longitudinally of this casing for exposing said rows of indications, a pinion rigid on said shaft intermediate said bearings, means for suspending said casing, means for counterbalancing the load and moving proportionate to the weight thereof, a draft-bar connected to said counterbalancing means and adapted to support the load, a rack connecting said draft-bar and pinion, pneumatic dash-pot cylinders removably secured at their closed ends to said casing and located on the outer sides of said load-counterbalancing means, said shaft, pinion and rack-bar being located between the said dash-pot cylinders, pistons in said dash-pot cylinders, end extensions on said draft-bar, and members pivotally connecting said pistons with said draft-bar end extensions; substantially as specified.

28. In a scale, the combination of a casing, a suspension means therefor, an indicator mounted in said casing, a draft-bar movable proportionate to the load applied thereto, means for applying a load to said draft-bar, a driving connection between said draft-bar and indicator, said draft-bar projecting through a slot in said casing, and a weight independent of but secured to said casing to adjust the center of gravity of said casing to obviate frictional contact between said casing and draft-bar, substantially as specified.

In witness whereof I have hereunto set my hand this 15th day of September, 1899.

ALBERT U. SMITH.

Witnesses:
RUFUS WAKEMAN,
GEORGE H. SLOVEN.

L346

No. 839,736. 927 PATENTED DEC. 25, 1906.

A. DE VILBISS, Jr.

COMPUTING SCALE.

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Fig. I.

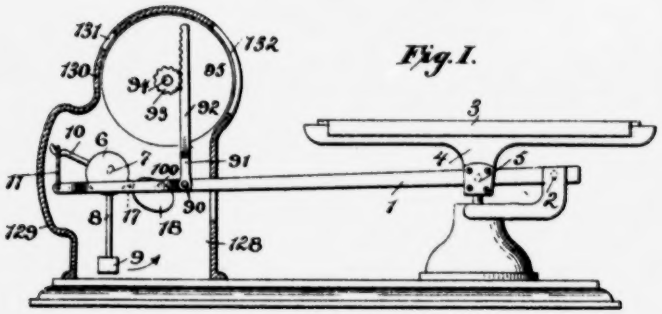
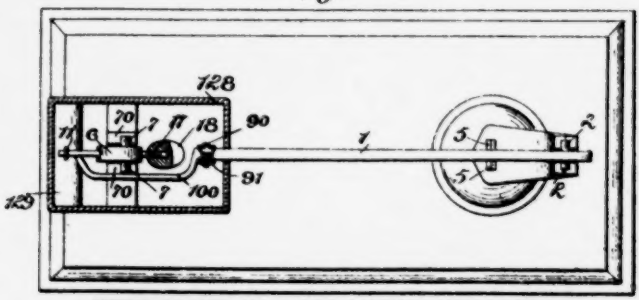


Fig. II.



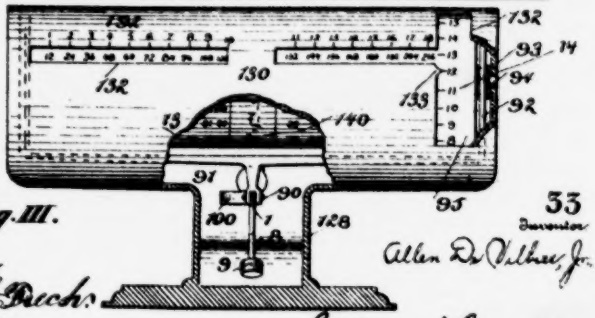


Fig. III.

33

Witnesses:
Geo. E. Beck.
G. R. Fiston.

Inventor:
Allen De Vilbiss, Jr.
By Collamer & Co.
Attorneys.

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UNITED STATES PATENT OFFICE.

ALLEN DE VILBISS, JR., OF TOLEDO, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO TOLEDO COMPUTING SCALE COMPANY, A CORPORATION OF NEW JERSEY.

COMPUTING-SCALE.

No. 839,736. Specification of Letters Patent. Patented Dec. 25, 1906.

Application filed April 9, 1901. Renewed May 31, 1904. Serial No. 210,406.

To all whom it may concern:

Be it known that I, ALLEN DE VILBISS, Jr., a citizen of the United States, and a resident of Toledo, Lucas county, State of Ohio, have invented certain new and useful Improvements in Computing-Scales, (Case No. 33;) and my preferred manner of carrying out the invention is set forth in the following full, clear, and exact description, terminating with claims particularly specifying the novelty.

This invention relates to scales of that class which compute or indicate the total weight and total price, preferably by means of a cylinder rotating on its axis within a casing which is provided with openings at suitable points to permit the dealer and the customer to see through them the results which it is desired shall be indicated; and the object of the present invention is to construct a scale of this type whose indicating mechanism, comprising the cylinder and the slotted casing, is combined with weighing mechanism substantially of the character covered by patents hitherto issued to me on this line of invention.

To this end the present invention consists in a construction of parts which shall adapt the indicating mechanism, above described, and the weighing mechanism to joint use in the simplest manner and whereby all necessary adjustments are permitted.

The following specification describes my preferred manner of carrying out the invention, whereas the claims embrace the salient points or combinations of elements, all as illustrated in the accompanying drawings, wherein—

Figure I is a side elevation of the weighing mechanism and a sectional view of the indicating mechanism. Fig. II is a plan view of this scale with the platform removed and the casing shown in section on a line through the main pivot. Fig. III is a longitudinal sectional view of the body portion of the casing with its drum-shaped housing partly broken away, so as to show the cylinder in elevation therein.

1 is the main scale-beam, fulcrumed at 2 on a support which rises from the base, and 3 is a pan or platform having a standard 4, pivotally supported, as at 5, upon said beam. The base supports a casing consisting of an upright body portion 128 (preferably having a rearward extension 129) and provided with a drum-shaped housing 130 at its top, which has openings 131 and 132 for a purpose to appear below.

6 is a disk having knife-edge bearings 7, supported upon blocks 70 within the body portion of the casing, and from this disk hangs rigidly a pendulum 8, having a weight 9 at its lower end. The scale-beam 1 is diverted from a straight line, as best seen at 100 in Fig. II, so that within the body portion of the casing it passes completely around the disk and the parts attached thereto and returns again to the line of its body, and at its extreme end a link 11 leads upwardly from this beam and is connected as by knife-edges, with a link-pivot 10, here shown as an arm projecting radially from the disk 6. From the latter, diametrically opposite the link-pivot, projects a counterbalance-arm 17, carrying a weight 18, the latter being sufficiently remote from the center 7 and of sufficient weight to counterbalance the weight of the link-pivot, the link, that end of the main beam, the pan or platform, and the connections hereinafter described by means of which the indicating mechanism is moved. As indicated in section in Fig. II, the arm 17 may be a screw and the weight 18 adjustable thereon, and I will hereinafter speak of this arm as a "screw."

In connection with a scale of the above type I preferably use indicating mechanism such as will now be described. Pivoted at 90 to the main beam is a fork 91, which extends upwardly and thence outwardly and then again upwardly into two arms 92, which are toothed, so that they constitute rack-bars. These engage the teeth of gears 93, mounted fast on the shaft 94 of the cylinder 95, rotatable within the housing 130; but it will be clear that any other suitable form of connections might be employed for converting an upward movement of the main beam 1 into a rotary movement of the cylinder. Herein where I speak of the devices shown as "connections" for this purpose I desire to be understood as including any equivalent devices for accomplishing this end.

The face of the cylinder is inscribed with a table 13, and in the present instance there are two bands around this cylinder, which

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are inscribed with weight-totals. Here one (numbered 14) is at one end, while the other (numbered 140) is at the center of the length of the cylinder, and the latter has its figures inverted and is exhibited through the opening 131 to the customer at the rear end of the scale. The endmost row of weight-totals here moves under a pointer 133 adjacent the opening 132, which is in the front side of the housing 130 or toward the dealer. On the front side of the housing adjacent the dealer is a row of figures 192, giving the various prices per pound, and the table 13 on the cylinder carries the total prices, which are so arranged thereon as to come under their respective prices per pound and be observable through the opening 132 when the proper weight-total 14 comes opposite the pointer 133. I do not limit myself to this exact arrangement; but I prefer it in scales of this type.

The operation is as follows: The commodity being placed upon the pan or platform 3, the outer end of the scale-beam 1 descends and through the link 11 causes a rotation of the disk 6 on its pivots 7, drawing the link pivot-arm 10 downwardly from its normal position, which is above that of the main pivot 7. This swings the weight 9 to the right, as indicated by the arrow, and lifts the counterbalance-weight 18 and the fork 91. I repeat that said weight 18 is of sufficient size and so adjusted on the screw 17 as to exactly counterbalance all parts of the scale when the latter is at rest. The pendulum 9 rises in proportion to the weight of the commodity, and the rack-bars 92 turn the gears 93 and rotate the cylinder 95 on its axis 94, as will be clear. The row 140 of weight-totals passing under the opening 131 is exposed to the customer, who may see that he obtains full weight, and meanwhile the row 14 of weight-totals passes under the pointer 133 and gives the same information to the dealer. With the present construction, however, that longitudinal row on the table 13 which corresponds to the total weight comes opposite the opening 132 on the dealer's side of the housing, and under the proper figure in the row 192 indicating the price per pound he can quickly see the total price. It is obvious that this arrangement of openings could be modified to some extent without departing from the spirit of my invention. The parts are of the desired sizes, shapes, proportions, and materials, and the invention may be used with or without other details which form no feature of the present case.

What is claimed as new is—

1. In computing-scales, the combination of a supporting-base, a scale-beam pivoted at or near one of its ends on said base, a platform pivotally mounted upon said beam inwardly beyond the latter's pivot, a substantially cylindrical casing mounted at an elevated position in rear of the platform over the rear end of the scale-beam and transverse thereto, said cylindrical casing being apertured in the side toward said platform above the plane of the top of the latter, a drum journaled in said casing with its axis transverse the beam and the latter centrally located with reference to said axis, said drum bearing weight and price inscriptions to show through said apertures of the casing, a gear-wheel secured to the drum, a rack-bar meshing with said gear-wheel and pivotally connected with the scale-beam where the latter extends below the drum, and load-counterbalancing means connected with the scale-beam in rear of the pivotal support thereon for the platform.

2. In computing-scales the combination of a supporting-base, a scale-beam pivoted at or near one of its ends on said base, a platform pivotally mounted upon said beam inwardly beyond the latter's pivot, a substantially cylindrical casing mounted at an elevated position in rear of the platform over the rear end of the scale-beam and transverse thereto, said cylindrical casing being apertured in the side toward said platform above the plane of the top of the latter, a drum journaled in said casing with its axis transverse the beam and the latter centrally located with reference to said axis, said drum bearing weight and price inscriptions to show through said apertures of the casing, gear-wheels secured to opposite ends of the drum, rack-bars meshing with said gear-wheels respectively and pivotally connected with the scale-beam where the latter extends below the drum, and load-counterbalancing means connected with the scale-beam in rear of the pivotal support thereon for the platform.

3. In computing-scales, the combination of a suitable supporting-base, a transversely-extending slotted cylindrical casing supported in elevated position at the rear part of said base, a rotary indicating drum or cylinder within said casing, a scale beam or lever fulcrumed at or near one of its ends on the forward part of the supporting-base and extending rearwardly at right angles to the axis of the said drum or cylinder to a point below the middle of the latter, a gear-wheel carried by said cylinder, a rack-bar engaging said gear-wheel, means pivotally connecting the rack-bar with the scale-beam where the latter extends below the cylinder, a platform pivotally supported upon said scale-beam in rear of the latter's fulcrum and centrally located in front of the indicating-cylinder below the slots in the latter's casing, and means operating automatically to counterbalance that portion of the scale-beam extending in rear of its fulcrum and the parts connected therewith which tend to depress it thus normally maintaining the indicating-cylinder at zero position, with provisions for a varying

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automatic augmentation to counterbalance varying loads placed upon the platform and to correspondingly limit the resultant rotation of the cylinder so that the correct indication of weight and price may be exhibited through the slots of the casing.

4. In computing-scales, the combination of a suitable supporting-base, a transversely-extending slotted cylindrical casing supported in elevated position at the rear part of said base, a rotary indicating drum or cylinder within said casing, a scale beam or lever fulcrumed at or near one of its ends on the forward part of the supporting-base and extending rearwardly at right angles to the axis of the said drum or cylinder to a point below the middle of the latter, gear-wheels carried by the cylinder at its opposite ends, rack-bars connected together to operate in unison and engaging said gear-wheels respectively, means pivotally connecting the rack-bars with the scale-beam where the latter extends below the cylinder, a platform pivotally supported upon said scale-beam in rear of the latter's fulcrum and centrally located in front of the indicating-cylinder below the slots in the latter's casing, and means operating automatically to counterbalance that portion of the scale-beam extending in rear of its fulcrum and the parts connected therewith which tend to depress it, thus normally maintaining the indicating-cylinder at zero position, with provisions for a varying automatic augmentation to counterbalance varying loads placed upon the platform and to correspondingly limit the resultant rotation of the cylinder so that the correct indication of weight and price may be exhibited through the slots of the casing.

5. In a scale, the combination with indicating mechanism of rotary character, the pan, the main beam, and connections between said beam and the indicating mechanism for turning the latter proportionately to the movements of the former; of a disk, a main pivot therefor, a pendulum carried thereby, a link pivot-arm supported by and projecting beyond the periphery of the disk, a link connecting this pivot-arm with the beam, and a counterbalance-weight projecting beyond the periphery of the disk opposite the link pivot-arm and of a size adapted to counterbalance all movable parts which are not supported on their own pivots.

6. In a scale, the combination with indicating mechanism of rotary character, the main beam, and connections between said beam and the indicating mechanism for turning the latter by the former; of a main pivot, a pendulum hanging rigidly therefrom, a rigid arm passing through said pivot at an oblique angle to the pendulum and having a link pivot-arm at one end and a screw at the other, a link connecting the link pivot-arm and the main beam, and a counterbalance-weight adjustable on said screw and of a size adapted to counterbalance all movable parts which are not supported on their own pivots.

7. In a scale, the combination with indicating mechanism of rotary character, weighing mechanism including the main beam, and connections between said beam and the indicating mechanism for turning the latter by the descent of one end of the former; of a main pivot, a pendulum hanging rigidly therefrom, a link pivot-arm projecting from the main pivot and standing normally above the latter, a link connecting the link pivot-arm with the descending end of the main beam, and a single adjustable weight carried by the main pivot opposite said link pivot-arm for counterbalancing all movable parts which are not supported on their own pivots.

8. In a scale, the combination with indicating mechanism of a rotary character mounted on an axis, a gear thereon, the weighing mechanism including a main beam diverted from the line of its straight body, a pivot standing within the divergent portion of the beam, a pendulum hanging therefrom, and connections at one side of said pivot between the pendulum and the beam; of a rack-bar pivoted to the beam at the other side of said pivot with its teeth engaging the gear of the indicating mechanism, and means for counterbalancing all movable parts which are not supported on their own pivots.

9. In a scale, the combination with indicating mechanism of a rotary character mounted on an axis, a gear thereon, the weighing mechanism including a main beam diverted from the line of its straight body, a pivoted disk standing within the divergent portion of the beam, a pendulum hanging from the disk, an arm projecting from the disk, and connections between the latter and the beam; of a rack-bar pivoted to the beam independent of said connections and having its teeth engaging the gear of the indicating mechanism, and means for counterbalancing all movable parts which are not supported on their own pivots.

10. In a scale, the combination with the casing having a plurality of openings, a cylinder journaled on a horizontal axis therein and inscribed on its face with figures to move under said openings, certain of the figures being inverted with respect to the remainder in order to permit their reading from the opposite side of the casing, the weighing mechanism including a main beam, and a fork whose stem is pivoted to the latter and whose arms are connected with the hubs of the cylinder so as to rotate it as the beam moves; of a pendulum mounted on a main pivot, a link pivot-arm projecting from the latter, a link connecting the link pivot-arm with the main beam, and means for counterbalancing the weight of all movable parts which are not supported on their own pivots.

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11. In a scale, the combination with the casing having openings, a cylinder journaled on a horizontal axis therein and inscribed on its face with figures to move under said openings, the weighing mechanism including a main beam diverted from the line of its straight body, and a fork whose stem is pivoted to the main beam and whose arms are connected with the hubs of the cylinder so as to rotate it as the beam moves; of a pendulum mounted on a main pivot, a link pivot-arm projecting from the latter, a link connecting the link pivot-arm with the main beam, a counterbalance-arm projecting from the main pivot opposite the link pivot-arm, and a counterbalance-weight thereon of a size to offset the weight of the link pivot-arm, the link, the main beam, the platform, the fork, and its connections, all substantially as described.

In testimony whereof I have hereunto subscribed my signature this 1st day of April, A. D. 1901.

ALLEN DE VILBISS, JR.

Witnesses:
EMMA EIBEN,
MAE TUTTLE.

[Second Edition.]

(Cut)

No. 678 A. D. 1895

Date of Application, 10th Jan, 1895—Accepted, 6th July, 1895

Complete Specification.

Improvements in Computating Mechanism for Use with Weighing Machines.

I, Edward William Wise, of East Las Vegas, in the County of San Miguel, Territory of New Mexico, Merchant, do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained, in and by the following statement:—

The present invention relates to that class of computing or calculating mechanism that are employed in combination with weighing machinery, and which, acting with such machinery, automatically compute and indicate relative values, as those of the price of goods to the measure or weight thereof, or of the weight to the price, or of the price rate to either.

One of the essential features of the present improvements is the combination of computing mechanism with weighing or similar measuring machinery, the arrangement and combination being such that the desired calculation or computation can be effected by a single operation—whether it be desired to ascertain the price for a given number of measure units, the measure units for a given price, or the measure units at a certain rate for a given price amount, as well as the rate for a given measure and the given price amount.

The invention consists in various features of improvement, and combinations of such features, which will be first described in full with their various advantages in the Specification and will be more particularly indicated in the statement of claims to follow their description.

In the accompanying drawings

Figure 1 is a perspective of platform scale mechanism, or weighing machinery, provided with my improved computing mechanism.

Figure 2 is an enlarged elevation view of the computing mechanism in partial section.

Figure 3 is a cross-section of the scale bearing cylinder and its enclosing casing and adjacent parts.

Figure 4 is a central lengthwise section of the same at the left hand end of Figure 2.

Figure 5 is a plan view of the weighing beam indicator and a cross section of its support.

Figure 6 is a face view of a portion of the computing table or scale which is borne on the computing cylinder and is the same as is illustrated in the previous figures; Figures 7 and 8 being modifications of the same.

Referring to the views and drawing in detail, A represents a common platform scale or weighing machine such as is known as a counter-scale. B is the beam of this scale, which beam is of ordinary form and construction. The size of the weighing machine or scale, or the length of beam is not essential, although for convenience of illustrating and explaining the improvements I have shown a scale weighing by a slide weight only to 10 pounds; also, various other forms of beam scales may be used with these improvements.

C indicates the drum or enclosing casing of the computing cylinder. This casing is supported upon the beam B of the weighing machine by the pillars or uprights D which latter are removably attached to the beam as by the screws E and F. This casing is preferably made of light sheet metal.

G is the computing cylinder, which is pivotally carried on the axis rod H journalled in the uprights D, and is composed preferably of light and thin material, such as paper, cylindrically mounted on disks I secured to the axis rod. The cylinder is arranged concentric with its casing and is of such a diameter that its peripheral surface is just within, but close to the inner surface of the exterior casing. The axis of this cylinder extends through the supporting pillar on the right hand end and carries the operative or hand wheel J by which the cylinder is turned. On the other end of this axis is fixed the gear wheel K which meshes with the small gear L on the worm shaft M pivotally mounted on the axle and lengthwise-adjustable pivot screws N, the latter being held to adjustable position by set screws O. P is a cylindrical casing surrounding the worm rod and enclosing the balance weight Q, which weight is threaded on the worm shaft and carries the indicator block R. This indicator block is attached to lug S depending from the travelling weight by means of the set screw T, the indicator being adjustable on such lug by the adjustable screws U. The casing P is slotted lengthwise for

the passage of the lug S, the inside diameter of the casing corresponding substantially with the diameter of the weight Q, which the casing also serves to guide, and to hold the same in close and accurate mesh with the worm shaft.

V is a rate-scale which is removably held in place between the slide flanges W secured to the front face of the casing of the computing cylinder. Preferably, a glass or other transparent and protecting slide strip X lies over the said rate scale, Figure 3, and under said flanges W. The width of the said scale is somewhat less than the opening between the slide flanges whereby is formed the observation slot or opening Y through which the surface of the computing cylinder can be viewed. The slide space is open at the right hand end, whereby the rate scale can be readily removed.

The rate scale at each end bears figures of weight, by pounds and ounces, and intermediate of its ends it bears figures, in bold face, upon spaces of equal width, which latter figures stand for rates per unit measure, as by the pound. At the top of this rate scale and over the said rate figures, are other figures, in smaller type (or they may be of different face type or different color of ink) which indicate a ten-fold increase of the rate figures immediately below them.

Z, Figure 6, indicates the table of figures which is borne on the computing cylinder, and which moves circularly with relation to the fixed rate scale V, fixed to the casing C, while Figures 7 and 8 show modifications of this computing table, the longitudinal divisions of the table in Figure 7 being the same as those in Figure 6, while the corresponding divisions in Figure 8 are the same with half divisions and half values. These tables may be printed on paper and secured to the surface of the cylinder, or the figures may be impressed directly thereon. The tables are divided into vertical columns, or columns running around the computing cylinder, of a width corresponding to the width of the divisions on the rate scale. The left hand columns contain figures which represent pounds and ounces, or these figures may signify other units of measure and fractions thereof. The columns corresponding to the rate divisions of the rate scale bear figures which indicate products of the rate figures and the measuring figures. These product figures are divided off by longitudinal spaces corresponding in angular space of the computing cylinder to the divisions of weight measure on the weighing beam. In Figure 7 the scale is shown as constructed

on the basis of single ounces, and in Figure 8 the scale is shown as arranged on the basis of one-half ounces.

The above described parts of mechanism, the rate scale and the table of computation, are adjusted relatively so that when the scale beam is balanced, no figures will appear under the observation slot Y in the casing of the computing cylinder or in other words, the scale beam is accurately balanced, and the computation table reads at zero.

The operation of the mechanism will now be apparent. Assuming that a quantity of merchandise is to be weighed, and bearing in mind that the rate scale represents in large figures the amount per weight, say the cents per pound, of the article being weighed, if the drum be moved, by the hand wheel until the beam is balanced, to a point (Figure 6) under the figure 5 in the rate-scale appears the numeral 10 on the table, then I know that two pounds of matter are weighed which, at five cents a pound, should be sold for ten cents. Conversely, I also know on the scale beam of the weighing mechanism that if said figure 10 is opposite the rate-scale Figure 5, I have the weight of the amount of material to be given for ten cents when the price is five cents per pound. In this connection it should be understood that the left-hand column of the table, and which is the basis of the arrangement of the table, is in pounds and ounces, one ounce for each movement of the table or horizontal division.

Taking now Figure 7, where the table is shown as based, (as indicated by its right-hand column) on single ounces for each movement of the table, it should be noted that if the figure 16 is shown under the figure 32 in the rate-scale, then eight ounces are being weighted, and the price at two cents per ounce, as indicated by the numeral 32 in the rate-scale, will be 16 cents.

Similarly in the case of Figure 8, halves of ounces are indicated, and the corresponding nearest full price at even cents per weight are indicated.

In each case the rates indicated on the rate-scale may be changed to suit the method of computation adopted in constructing the computing table.

I desire to call special attention to the fact that for these various computations only one movement of the mechanism is necessary, which is that of turning the hand wheel, that is to say, the traveling beam weight travels in exact proportion to the rotation of the computing cylinder, or vice

versa. At all times the actual weight of the goods, the price rate per unit measure thereof, and the computed price, are in view to the observer.

It is also essential to note that the beam weight is operated through and by the instrumentality of the computing cylinder. Experience shows, that this weight may be more quickly adjusted and a balance more readily and accurately secured, by operating the weight through and by the computing cylinder, than is possible by applying adjusting force to the beam weight and along its path and operating the said cylinder thereby. Also, the operator can more quickly test the balance of the beam by manipulating the hand wheel of the computing cylinder, than could he test such balance by the push necessary to be applied to the beam weight to get the balance sought for in that way. Hence, I regard it of importance to provide a beam weight operating device consisting essentially of a hand wheel on the cylinder, which, it is to be further noted, rotates and has its operative pressure applied thereto in a plane at right angles to the beam, and hence without distributing the beam so much as in case of directly manipulating the weight itself.

I also call attention to the mechanisms by which the worm rod and indicator are adjusted. These mechanisms are essential to such a device, since thereby inaccuracies which might occur by reason of wear are readily corrected. Again, the beam scale, the indicator thereon and the computing scale being before the observer, inaccuracies of computation can be at any time discovered, as, when the beam weight stands at zero, the observation of the computing table should be of zero value.

When it is desired to weigh goods of greater weight than is indicated by the scale on the beam, an additional weight A^1 may be hung to the free end of the beam which additional weight in itself is a balance for, say, ten pounds. Under these circumstances, the amount indicated by the computing table should be added to the amount indicated on the rate scale and over the regular rate figures.

The computing table may be variously changed, that is to say, the figures thereof may be based upon measures of different kinds than pounds and ounces; and correspondingly, the rate scale may bear values of different relations other than those as between weights and prices for weights.

Having now particularly described and ascertained the

nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. In combination with a weighing mechanism, a calculating mechanism operating in conjunction with and by said weighing mechanism and for the purpose of indicating price amounts of the articles being weighed, substantially as set forth.

2. In combination with a mechanism for weighing articles, a price computing mechanism operably attached to a part of the said weighing mechanism which is movable by the article being weighed, and which computing mechanism is adapted under movement of said moving part to indicate the price of the articles being weighed, substantially as set forth.

3. In combination with the weighing weight of a weighing machine, a price computing mechanism operably connected to said weight and moved therewith, whereby as the said weight is actuated by an article being weighed the corresponding price of the article will be indicated by said computing mechanism, substantially as set forth.

4. In combination with the scale beam of a weighing mechanism and the sliding weight thereon, a price computing table operably connected to said weight; and means substantially as described whereby the said weight is moved on the scale by movement of the said table, substantially as set forth.

5. In combination with the scale beam and its movable balance weight, a table of computed price amounts operably connected to said weight, whereby as said weight is moved to indicate the weight of an article a corresponding price amount will be indicated by said computing mechanism, substantially as set forth.

6. In combination in the herein described weighing and price computing mechanism, the scale beam and sliding weight thereon, the computing cylinder and casing enclosing the same, and mechanism operably connecting the said computing cylinder and the said slide weight, whereby prices of the article being weighed are indicated by the movement of said weight, substantially as set forth.

7. In combination with a platform scale and with the weight indicator thereof, a price computing table operably connected with said weight indicator, whereby upon movement of the indicator said computing table will indicate a

price figure according to the weight of the article being weighed, substantially as set forth.

8. In combination, with a scale beam graduated to indicate amounts of weight and with a balance weight adapted to travel along the beam, a table of computed price figures movably mounted on the beam, a rate scale mounted on the beam in fixed relation to said table, and mechanism operatively connecting the table and traveling weight, whereby the table and weight have conjoint relative motion to exhibit, on the beam, weight-amounts and to exhibit opposite the rate scale, price amounts, substantially as set forth.

9. In combination, with a scale beam and its movable balance weight, a table of computed amounts movably mounted on the beam, a rate scale mounted on the beam in fixed position relatively to said table, and screw mechanism geared to said table and engaging said weight, whereby the table and weight have conjoint relative motion, substantially as set forth.

10. In a computing mechanism for attachment to a scale beam and its balance weight, the combination of supports for removably engaging the beam, a rotating cylinder mounted in said supports and bearing computed amounts, a rate scale fixed to said supports adjacent said cylinder, and mechanism also mounted upon said supports engaging said cylinder and adapted to engage the beam weight, whereby the said cylinder and weight will have conjoint relative motion, substantially as and for the purpose set forth.

11. In combination, the scale beam and the balance weight movable thereon, a screw arranged parallel with the beam and engaging said weight, a computing cylinder geared to said screw, and a stationary scale adjacent said cylinder, and means for adjusting said screw and the weight engaging the same, as and for the purpose set forth.

12. In combination with the scale beam and its sliding weight, the screw engaging said weight and actuated to move the same along the beam, and the indicator adjustably fixed upon said weight, as and for the purpose set forth.

13. In combination, with the scale beam and the balance weight movable thereon, the screw or worm mounted on said beam and engaging said weight, the casing enclosing said worm and said weight, the computing cylinder journalled in supports on said beam and geared to said worm, the casing

enclosing said cylinder and bearing a rate scale, and the hand wheel for rotating said cylinder arranged substantially as set forth.

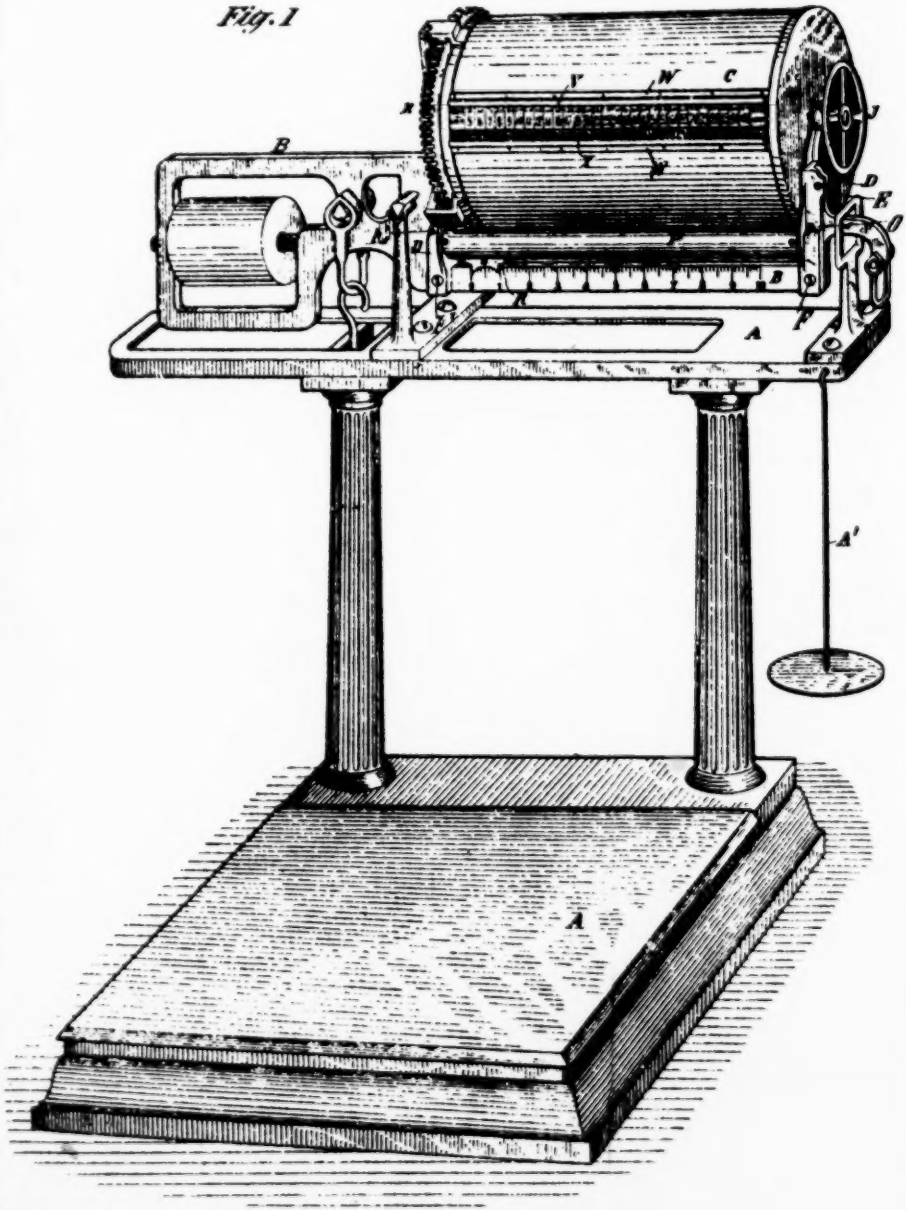
Dated this 10th day of January 1895.

HASELTINE, LAKE & Co.,
45 Southampton Buildings, London, W. C.,
Agents for the Applicant.

(3rd Edition)

SHEET 1.

Fig. 1



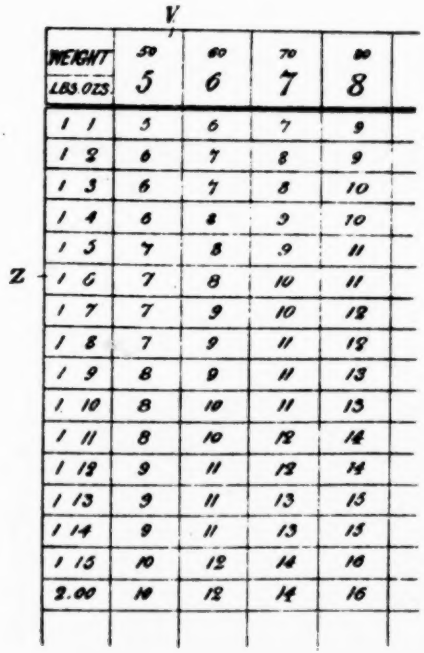
[This Drawing is a reproduction of the Original on a reduced scale.]

(4 SHEETS)

Fig. 2.

Malby & Sons Photo-Litho

Fig. 6



WEIGHT LBS. OZS.	50 5	60 6	70 7	80 8
1 1	5	6	7	9
1 2	6	7	8	9
1 3	6	7	8	10
1 4	6	8	9	10
1 5	7	8	9	11
1 6	7	8	10	11
1 7	7	9	10	12
1 8	7	9	11	12
1 9	8	9	11	13
1 10	8	10	11	13
1 11	8	10	12	14
1 12	9	11	12	14
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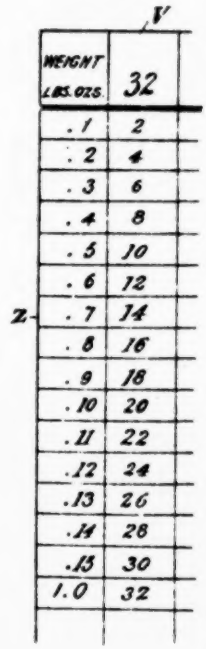
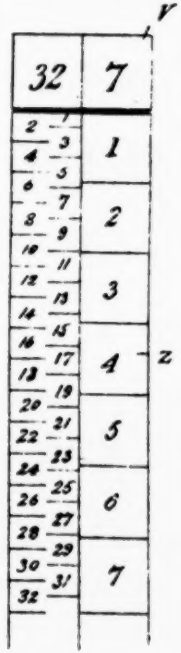
1 15	10	12	14	16
2.00	10	12	14	16

Fig. 7



WEIGHT LBS. OZS.	32
.1	2
.2	4
.3	6
.4	8
.5	10
.6	12
.7	14
.8	16
.9	18
.10	20
.11	22
.12	24
.13	26
.14	28
.15	30
1.0	32

Fig. 8



32	7
2 1	1
4 3	
6 5	2
8 7	
10 9	3
12 11	
14 13	4
16 15	
18 17	5
20 19	
22 21	6
24 23	
26 25	7
28 27	
30 29	
32 31	

Fig. 3

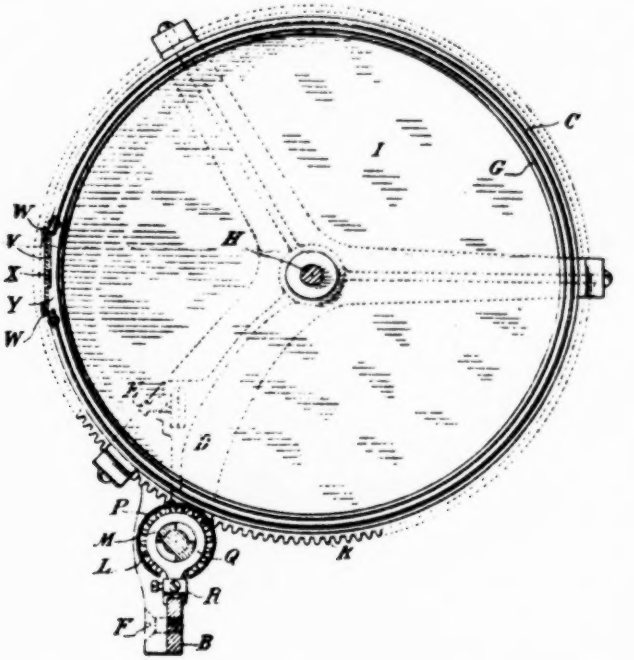


Fig. 4

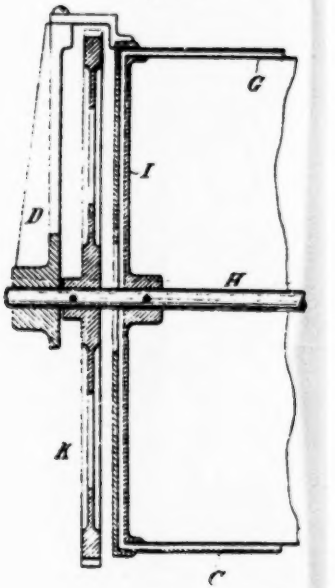
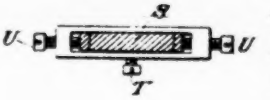


Fig. 5



Northern District of Illinois } ss.
Eastern Division. }

I. T. C. MacMillan, Clerk of the District Court of the United States for the Northern District of Illinois, do hereby certify the above and foregoing to be a true and complete transcript of the proceedings had of record, made in accordance with Stipulation filed in said court on the fifteenth day of July, 1912, in the cause entitled The Computing Scale Company, Complainant vs. Toledo Computing Scale Company, Defendant, No. 30024, as the same appear from the original Records and Files thereof, now remaining in my custody and control.

In Testimony Whereof, I have hereunto set my hand and affixed the seal of said Court, at my office, in the City of Chicago, in said District, this seventeenth day of July, 1912.

T. C. MacMillan,
Clerk,

(Seal)

By John H. R. Jamar,
Deputy Clerk.

United States of America, } ss.

The President of the United States, To The Computing Scale Company—Greeting:

You are hereby cited and admonished to be and appear at a United States Circuit Court of Appeals, for the Seventh Circuit, to be holden at Chicago, within thirty days from the date hereof, pursuant to a petition for appeal duly allowed and filed in the Clerk's Office of the District Court of the United States for the Northern District of Illinois, Eastern Division, wherein Toledo Computing Scale Company is the defendant-appellant and you are the appellee to show cause, if any there be, why the decree rendered against the said defendant as in the said petition for appeal mentioned, should not be corrected and why speedy justice should not be done to the parties in that behalf.

Witness Kenesaw M. Landis, Judge of the District Court of the United States, this 25th day of June, in the year of our Lord one thousand nine hundred and twelve.

KENESAW M. LANDIS.

Service of foregoing citation acknowledged this 25th day of June 1912.

SHERIDAN, WILKERSON, SCOTT & RICHMOND,
Solicitors for Complainant.

(Endorsed) Filed Jun 25 1912 at ..... o'clock ..... M. T. C. MacMillan Clerk.

UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

I, Edward M. Holloway, Clerk of the United States Circuit Court of Appeals for the Seventh Circuit, do hereby certify that the foregoing printed pages, numbered from 1 to 946, inclusive, contain a true copy of the printed record, printed under my supervision, and filed on the twentieth day of August, 1912, on which this cause was heard and determined, in the case of

Toledo Computing Scale Company

vs.

The Computing Scale Company

No. 1934, October Term, 1911, as the same remains upon the files and records of the United States Circuit Court of Appeals, for the Seventh Circuit.

In testimony whereof I hereunto subscribe my name and affix the seal of said United States Circuit Court of Appeals for the Seventh Circuit, at the City of Chicago, this 23rd day of November A. D. 1921.

EDWARD M. HOLLOWAY

(Seal) *Clerk of the United States Circuit Court of Appeals for the Seventh Circuit.*

At a regular term of the United States Circuit Court of Appeals for the Seventh Circuit begun and held in the United States Court Room in the city of Chicago in said Seventh Circuit on the third day of October 1911, of the October term in the year of our Lord one thousand nine hundred and eleven and of our Independence the one hundred and thirty-sixth year.

And afterwards, to-wit: On the twenty-fourth day of July, 1912, in the October term last aforesaid, came the appellee, by its counsel, Mr. Thomas F. Sheridan, Mr. George L. Wilkinson, Mr. W. A. Scott and Mr. Carl A. Richmond, and filed in the office of the clerk of this court their appearance, which said appearance is in the words and figures following, to-wit:

UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

No. 1934 October Term, 1911.

Toledo Computing Scale Company,
Appellant,

vs.

The Computing Scale Company,
Appellee.

The Clerk will enter my appearance as counsel for the appellee.

THOMAS F. SHERIDAN
GEO. L. WILKINSON
W. A. SCOTT
CARL A. RICHMOND.

Endorsed: Filed July 24, 1912. Edward M. Holloway, Clerk.

And afterwards, to-wit: On the twenty-ninth day of July, 1912, in the October term last aforesaid, came the appellant, by its counsel, Mr. Frank P. Davis and Mr. Edward Rector, and filed in the office of the clerk of this court their appearance, which said appearance is in the words and figures following, to-wit:

UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

No. 1934. October Term, 1911.

Toledo Computing Scale Company,

Appellant,

vs.

The Computing Scale Company,

Appellee.

The Clerk will enter my appearance as counsel for the appellant.

FRANK P. DAVIS,
EDWARD RECTOR.

Endorsed: Filed July 29, 1912. Edward M. Holloway, Clerk.

And afterwards, to-wit: On the third day of September, 1912, in the October term last aforesaid, there was filed in the office of the clerk of this court a certain Certificate of Exhibits, which said Certificate is in the words and figures following, to-wit:

Northern District of Illinois } ss.
Eastern Division. }

I, T. C. MacMillan, Clerk of the District Court of the United States for the Northern District of Illinois, do hereby certify that I herewith transmit to the United States Circuit Court of Appeals for the Seventh Judicial Circuit, certain true and original exhibits filed in the cause entitled The

Computing Scale Company *vs.* Toledo Computing Scale Company.

Said exhibits are marked as follows, to-wit:

Complainant's Exhibit Poole Curve Diagram;
Complainant's Exhibit, Poole Sketch;
Complainant's Exhibit, Sample Magazine Cover;
Defendant's Exhibit, Netter Account Book;
Defendant's Exhibit, Culmer Sketch;
Defendant's Exhibit, Untreated Chart Sheet;
Defendant's Exhibit, Wise Photograph;
Defendant's Exhibit, Photograph of Milburn Scale;
Defendant's Exhibit, The Balance of 1894;
Defendant's Exhibit, The Balance of 1895;
Defendant's Exhibit, Milburn Number Strips;
Defendant's Exhibit, Computing Scale Company Publication #3;
Defendant's Exhibit Milburn Envelope;
Defendant's Exhibit, Drawing of Milburn Scale;
Defendant's Exhibit, Milburn Chart Sketch;
Defendant's Exhibit, Dayton Cylinder Scale;
Defendant's Exhibit, Milburn Scale (2) Wooden Pivot Heads;
Defendant's Exhibit, Milburn Scale (2) Iron Spiders;
Defendant's Exhibit, Milburn Scale (2) Brass Spiders;

In Testimony Whereof, I have hereunto set my hand and affixed the seal of said Court, at my office, in the City of Chicago, in said District, this 22nd day of July, 1912.

T. C. MacMillan,
Clerk.

(Seal)

By John H. R. Jamar,
Deputy Clerk.

Endorsed: Filed Sept. 3, 1912. Edward M. Holloway, Clerk.

At a regular term of the United States Circuit Court of Appeals for the Seventh Circuit begun and held in the United States Court room in the City of Chicago in said Seventh Circuit on the first day of October, 1912, of the October term in the year of our Lord one thousand nine hundred and twelve and of our Independence the one hundred and thirty-seventh year.

1912. And afterwards, to-wit: On the first day of October, 1912, in the October term last aforesaid, the following further proceedings were had and entered of record, to-wit:

Tuesday, October 1, 1912.

Present:

Hon. William H. Seaman, Circuit Judge, presiding.
Hon. Christian C. Kohlsaat, Circuit Judge.
Edward M. Holloway, Clerk.
Luman T. Hoy, Marshal.

Toledo Computing Scale Company
1934 *vs.*
The Computing Scale Company.
} Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.

It is ordered by the court that this cause be, and the same is hereby set down for hearing on November 15, 1912.

And afterwards, to-wit: On the sixth day of November, 1912, in the October term last aforesaid, there was filed in the office of the clerk of this court a certain Stipulation, which said Stipulation is in the words and figures following, to-wit:

IN THE UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

Toledo Computing Scale Company,
Appellant,
vs.
The Computing Scale Company,
Appellee.
} No. 1934.

STIPULATION.

It is hereby stipulated by and between the parties to the above-entitled cause that the hearing of the appeal therein may, with the approval of the court, be continued to the Jan-

uary, 1913, term of said court, and both parties hereby move the court for such continuance.

EDWARD RECTOR,
Of counsel for Appellant.
THOMAS F. SHERIDAN,
Of counsel for Appellee.

Chicago, Illinois, November 4, 1912.

Endorsed: Filed Nov. 6, 1912. Edward M. Holloway, Clerk.

And afterwards, on the same day, to-wit: On the sixth day of November, 1912, in the October term last aforesaid, the following further proceedings were had and entered of record, to-wit:

Wednesday, November 6, 1912.

Court met pursuant to adjournment and was opened by proclamation of crier.

Present:

Hon. Francis E. Baker, Circuit Judge, presiding.
Hon. William H. Seaman, Circuit Judge.
Hon. J. Otis Humphrey, District Judge.
Edward M. Holloway, Clerk.
Luman T. Hoy, Marshal.

1934 Toledo Computing Scale Company *vs.* The Computing Scale Company. } Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.

Upon the filing of a stipulation of counsel, it is ordered that this cause be, and the same is hereby continued to the January session of the present term of this court.

And afterwards, to-wit: On the seventh day of January, 1913, in the October term last aforesaid, the following further proceedings were had and entered of record, to-wit:

Tuesday, January 7, 1913.

Court met pursuant to adjournment and was opened by proclamation of crier.

Present:

Hon. Francis E. Baker, Circuit Judge, presiding.
Hon. Christian C. Kohlsaat, Circuit Judge.
Hon. J. Otis Humphrey, District Judge.
Edward M. Holloway, Clerk.
Luman T. Hoy, Marshal.

1934 Toledo Computing Scale Company *vs.* The Computing Scale Company. } Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.

It is ordered by the court that this cause be, and the same is hereby set down for hearing on January 21, 1913.

And afterwards, to-wit: On the twenty-first day of January, 1913, in the October term last aforesaid, the following further proceedings were had and entered of record, to-wit:

Tuesday, January 21, 1913.

Court met pursuant to adjournment and was opened by proclamation of crier.

Present:

Hon. Francis E. Baker, Circuit Judge, presiding.
Hon. Christian C. Kohlsaat, Circuit Judge.
Hon. Francis M. Wright, District Judge.
Edward M. Holloway, Clerk.
Luman T. Hoy, Marshal.

Toledo Computing Scale Company
1934 *vs.*
The Computing Scale Company.

Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.

Now this day come the parties by their counsel and this cause now comes on to be heard on the printed record and briefs of counsel, and on oral argument by Mr. Edward Rector, counsel for appellant, and by Mr. Walter A. Scott, counsel for appellee, and the court having heard the same takes this matter under advisement.

Toledo Computing Scale Company
1934 *vs.*
The Computing Scale Company.

Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.

Now this day come the parties by their counsel and the motion of appellant that this appeal be dismissed as to reissue patent No. 11,536 with leave to introduce newly discovered evidence in the District Court of the United States for the Northern District of Illinois, Eastern Division, now comes on to be heard on oral argument by Mr. Edward Rector, counsel for appellant, in support of said motion, and by Mr. Thomas F. Sheridan, counsel for appellee, in opposition thereto.

On consideration whereof, It is now here ordered that the said motion be, and the same is hereby denied.

---

13. And afterwards, to-wit: On the fifteenth day of April, 1913, in the October term last aforesaid, there was filed in the office of the clerk of this court the Opinion of the court, which said Opinion is in the words and figures following, to-wit:

IN THE UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

No. 1934. October Term, 1912. January Session, 1913.

Toledo Computing Scale Company, *Appellant,*
vs.
The Computing Scale Company, *Appellee.*

Before BAKER and KOHLSAAT, *Circuit Judges*, and WRIGHT, *District Judge.*

Appellant (defendant) was adjudged to be an infringer of claims 5 and 6 of reissued patent no. 11536, April 28, 1896, and of claim 2 of patent no. 579300, Jan. 11, 1898. Each was issued on application of Albert U. Smith, for improvements in automatic computing scales.

As the scales of complainant and defendant are identical so far as the claims in suit are concerned, the questions to be considered are the patentable novelty of the claimed improvements, the validity of the reissue, and the sufficiency of complainant's proof of title.

Prior art facts of record, which are deemed controlling, are stated in the opinion.

Claims 5 and 6 of the reissued patent are as follows:

"5. An indicator-drum for weighing mechanism, consisting of a spindle provided with a plurality of skeleton frames of light material and secured to said spindle, and having secured to their peripheries a sheet of paper forming a cylinder.

"6. An indicator-drum for weighing mechanism consisting of a spindle provided with a plurality of skeleton disks or

frames of thin aluminum having a sheet of paper extending around and secured to their peripheries to form a cylinder."

In applying for the reissue Smith made no changes in the drawings, the descriptions, or the four claims of the original patent, no. 545616, Sept. 3, 1895. Application for the reissue was made on Jan. 27, 1896, and the desired change consisted in adding claims 5, 6 and 7 to the original claims. Claim 2 of the original (reproduced in the reissue) was the only one that related to the subject-matter of reissue claims 5 and 6, and it reads as follows:

"2. The combination of the indicator-drum constructed of thin skeleton frames of a very light material, the periphery of said drum being formed of a sheet of paper having the divisions of the weight-scale and other numerals printed thereon, the pinions carried by the shaft of said drum, adjustable conical bearings wherein said shaft is journaled, the cross-bar *c* having a suspending-clip secured thereon, the headed draft-pins supported loosely within the notched ends of the cross-bar *c* after the manner of a stirrup connection, the bow-shaped clips in the ends of the draft-pins, the springs between the coils of which said clips are inserted, whereby the tension on said springs may be altered as described, the draft-rods *k*, the yoke *n* whereby said rods are connected, the cross-rod *a* to which the rack-bars are pivoted and whose ends are notched and embrace said draft-rods so as to be capable of sliding thereon, a ring from which the scale-pan is suspended, and suitable adjusting connections between the yoke *n* and said cross-rod *a'*, substantially as described."

Part of the description of Smith's invention as set forth in his original application is in these words:

"The object of my invention is to provide scales of this description which shall be extraordinarily sensitive to weights of small amount and to accurately register the same. A further object of my invention is to provide an adjusting mechanism by the use of which the springs employed may at all times be held at uniform tension, or, in other words, when said springs have become weakened or distorted by long usage the adjusting mechanism may be employed to restore a proper tension to said springs; also, said adjusting mechanism may be used to set the scales at a 'balance' after the weighing-pan is suspended therefrom, and the difference in weight of various kinds of weighing-pans may be compensated for by the use of this mechanism."

And in order to accomplish the first of the stated objects of his invention, Smith prescribed:

"It is a very essential feature that the indicator-drum in scales of this nature should be made of very light material, for the reason that if it be not so made the sensitiveness and accuracy of the scales will be more or less affected. For instance, heretofore in scales of this character if a given quantity is weighed successively a number of times it will be found that said scales scarcely ever indicate the weight of such quantity twice exactly the same, there always being some slight variation in the amount registered. This is in a great measure due to the fact that the more the actual weight of the indicator-drum itself the greater must be the force to operate it, and in order to overcome this disadvantage I have constructed the drum of thin skeleton frames of aluminium, while the periphery is formed of a thin sheet of paper pasted to the frames. In this way I have secured a structure that is so light that the force necessary to operate it is almost insignificant."

So far as it needs consideration, the reissue statute reads:

"Sec. 4916. Whenever any patent is inoperative or invalid, by reason of a defective or insufficient specification, or by reason of the patentee claiming as his own invention or discovery more than he had a right to claim as new, if the error has arisen by inadvertence, accident, or mistake, and without any fraudulent or deceptive intention, the Commissioner shall, on the surrender of such patent and the payment of the duty required by law, cause a new patent for the same invention, and in accordance with the corrected specification, to be issued to the patentee," etc.

Claim 2 of the second patent is this:

"2. In a scale of the character described, the combination with a casing having openings in opposite sides but not opposite each other, of a revoluble drum provided with a series of columns of figures representing dollars and cents and two independent columns of figures representing weights in pounds and ounces, one column of the latter being arranged to be read from the same side of the casing as the figures representing dollars and cents, and the other column of weight-figures being arranged to be read solely through the opening in the opposite side of the casing, the figures representing dollars and cents not being visible from said opposite side, the openings in the opposite sides of the casing being covered with transparent material having stationary pointers thereon adapted to correspond with each other in their indications of figures so that when the pointer on one side

indicates one figure in one column, the other pointer on the other side will indicate exactly the same figure in the other column."

Respecting the title, the only difficulty arises in connection with an assignment from the E. C. Smith Company, a corporation, and another assignment of identical character. Signature was as follows:

"THE E. C. SMITH COMPANY,
CHAS. R. LUCE,
Pres't,
WILLIAM G. BELL,
Treas."

No corporate seal was affixed. No recital appears that Luce was president and Bell treasurer, or that they as such officers were authorized to execute the assignment in the name and on behalf of the corporation. An acknowledgment, in the following words, was attached.

"State of Massachusetts, County of Suffolk, ss:

"March 8th, 1899, personally appeared before me the persons known to be Charles R. Luce and William G. Bell, who executed the above instrument in my presence, and acknowledged the signing of the same to be their voluntary act and deed.

"(Seal) C. F. BROWN,
Notary Public."

BAKER, *Circuit Judge,* delivered the opinion of the court:

In this record the greatest thing is the fact that Smith put in the hands of the world's vendors of commodities the first usable automatic computing scale. Long before Smith's time, and the length of the interval is a fact of considerable weight, the paper art (Phinney's patent no. 106869 in 1870 and Babcock's no. 421805 in 1890) had professed to teach practical scale-makers how to build automatic computing scales. But when those disclosures were given materiad bodies, failure was the result. Just as Smith said in his specification, they would not work twice alike, they were not reliable. Today in the light of what Smith accomplished it may be easy enough to see exactly where the difficulty lay; but this record proves that during the long interval between Phinney and Smith some of the brightest and most skillful men in the scale business, realizing what a tremendous commercial success was awaiting a reliable automatic comput-

ing scale, did not draw from Phinney's patent, nor from elsewhere in the prior art, nor from their own experience as practical mechanics, nor from their own ingenuity, any conception of the necessary means. In the prior art were combinations of indicator-drums and weighing mechanisms. But the cause of their failure might lie at any one of many points. It remained for Smith to discover that the most essential thing in reorganizing the old elements was to make the drum so light that its interference with the weighing operation would be eliminated. And he embodied that conception or "happy thought" in the new means described in the patent and covered by the claims of the first patent in suit. The evidence in this record (and we have considered, though we have not thought it necessary to discuss, the remoter references to the non-automatic art) instead of overcoming, has strongly fortified the presumption of invention.

Defendant insists, however, that making the drum lighter was merely a matter of degree. Of course the lessening of weight is a matter of degree; but it is not necessarily merely a matter of degree. If the change converts failure into success, something more than a matter of degree is involved. Unreliable automatic computing scales, in the practical art, are no scales at all. A reliable automatic scale was a new mechanism, a creation, just as in the aspirin case (*Kuehmsted* v. *Farbenfabriken of Elberfeld Co.*, 179 Fed. 701) this court held that the reduction of the amount of impurities in a compound theretofore known to chemists, whereby a deleterious substance was converted into a valuable medicine, was not merely a change of degree, but was a change of kind, producing a new article of commerce.

A further insistence is made that the patent is void for indefiniteness in this, that the degree of thinness of the aluminum frame and of the paper cylinder are not specified. In the quoted part of the specification Smith substantially told those skilled in the art to make the skeleton frame to the last degree of thinness that would support the cylinder, and to make the cylinder of the very thinnest paper they could then or thereafter find in the market, which would be stiff enough to retain its shape when attached to the frame. This, it seems to us, was very clear and definite instruction.

It is also contended that the reissue patent was improperly granted. In *McDowell* v. *Ideal Concrete Machinery Co.*, 187 Fed. 814, this court considered the requirements of the reissue statute, and found that the new claims in that case

were invalid because they were not for "the same invention" that was disclosed as the applicant's in his original description. But here the quoted part of the applicant's original description shows that the idea of the light drum, the purpose to be accomplished by it, and the means by which it was to be produced, constituted the principal part of his invention. But it was not covered except in original claim 2, and there only in combination with particularly described weighing mechanism. So, under the original patent, if any one should alter the weighing mechanism, he could avoid claim 2 and thus appropriate the largest part of what Smith had stated to be his invention. Inasmuch as the value of the drum invention was not dependent upon its association with the specific weighing mechanism provided by Smith, he would have been clearly entitled, in our judgment, to have included reissue claims 5 and 6 in his original specification. These claims cover the combination of the Smith "indicator-drum" with any "weighing mechanism," which, with the drum, will produce a practicable automatic weighing scale. Though they are broader than original claim 2, they are not broader than the invention described as Smith's in his original statement of invention. In his application for reissue, made promptly and before any rights of defendant or the public had intervened, he swore that he had not intended to dedicate that principal part of his invention to the public, and that the omission of claims of the character of 5 and 6 had occurred through inadvertence. In our view the Commissioner was warranted in granting the reissue. Compare *Topliff* v. *Topliff*, 145 U. S. 156; *Houghton* v. *Whitin Machine Works*, 153 Fed. 740; *Gaskill* v. *Meyers*, 81 Fed. 854.

It follows that the finding of validity and infringement of the reissue claims was correct.

Claim 2 of the second patent shows that all that Smith contributed to the art, beyond the disclosures of his reissue patent, was to put upon the indicator-drum a column of figures, in inverse order to that of the column already there, so that the purchaser might read the weight through an opening in the back of the casing. If the concept involved had been Smith's, there might not be much difficulty in sustaining the claim, however obvious the application of the concept might seem. But the whole idea was old. "Back-indication," by reversing the figures, had long been commonly employed in indicating apparatuses, like cash-registers for example (Pottin's patent no. 312,014 and others); and whatever claim

might otherwise have been made for ingenuity in modifying and adapting the old means to an automatic computing scale is destroyed by referring to the way Smith had already put upon the drum the column of figures to be read by the seller. This claim, we think, is clearly void for lack of invention.

In regard to the acknowledgment of a corporation's conveyance, the Massachusetts statutes (Rev. Laws Mass. 1901, ch. 127, §§ 7 and 18) required (what is commonly called for in all jurisdictions with which we are familiar) that the notary's certificate should show that the persons who signed as officers were personally known to the notary, that on oath they stated they were such officers and were authorized by the board of directors to execute the instrument and that the corporation either had no seal or that its genuine seal was affixed to the instrument, and that they thereupon acknowledged said instrument to be the free act and deed of the corporation. Execution of the instruments here in question was not proven by testimony. Certified copies of assignments of patents, not duly acknowledged, are not proof of execution. *Paine* v. *Trask*, 56 Fed. 233; *New York* v. *Cable Co.*, 60 Fed. 1016; *National Co.* v. *Navy Co.*, 99 Fed. 89. As the acknowledgments of these assignments are insufficient in every respect to constitute good corporate acknowledgments, the record is barren of proof of execution.*

The decree is reversed with the direction to dismiss the bill on the second patent and to permit complainant to introduce proofs of title to the first patent.

And afterwards, on the same day, to-wit: On the fifteenth day of April, 1913, in the October term last aforesaid, the following further proceedings were had and entered of record, to-wit:

*On the sufficiency of the acknowledgments defendant cited: *Lumbard* v. *Aldrich*, 6 N. H. 269; *Bennett* v. *Knowles*, 66 Minn. 4; *Lovett* v. *Saw Mill Association*, 6 Paige Ch. (N. Y.), 60; *People* v. *Rochester*, N. Y. Sup. Ct. 2 Thomp. & Cook, 142; *Malloye* v. *Coubrough*, 96 Cal. 649; *Holt* v. *Trust Co.*, 11 So. Dak. 456; *Endowment Assn.* v. *Fisher*, 71 Md. 430; *Clemme* v. *McLay*, 68 Iowa, 158; *McChesney* v. *Brown*, 29 Fed. 145. And complainant cited: *Tenney* v. *East Warren Lumber Co.*, 43 N. H. 343; *Banner* v. *Rosser*, 96 Va. 252; *Catherine D. Fitch* v. *Lewiston Steam Mill Company et al.*, 80 Maine 34; *The Frostburg Mut. Bldg. Assn.* v. *Wm. Brace et al.*, 51 Md. 508; *Ferguson et al.* v. *Ricketts et al.*, 55 S. W. 974 (Texas).

Tuesday, April 15, 1913. Decree Apr

Court met pursuant to adjournment and was opened by proclamation of crier.

Present:

Hon. Francis E. Baker, Circuit Judge, presiding.
Hon. William H. Seaman, Circuit Judge.
Hon. Christian C. Kohlsaat, Circuit Judge.
Edward M. Holloway, Clerk.
Luman T. Hoy, Marshal.

Before:

Hon. Francis E. Baker, Circuit Judge.
Hon. Christian C. Kohlsaat, Circuit Judge.
Hon. Francis M. Wright, District Judge.

Toledo Computing Scale Company
1934 *vs.*
The Computing Scale Company
} Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.

This cause came on to be heard on the transcript of record from the District Court of the United States for the Northern District of Illinois, Eastern Division, and was argued by counsel.

On consideration whereof, It is now ordered, adjudged and decreed by this court that the decree of the said District Court in this cause be, and the same is hereby reversed with costs; and that this cause be, and the same is hereby remanded to the said District Court with the direction to dismiss the bill on the second patent No. 579,300, and to permit complainant to introduce proof of title to the first patent, re-issue No. 11,536.

And afterwards, to-wit: On the fourteenth day of May, 1913, in the October term last aforesaid, a certain Motion and Affidavits were filed in the office of the clerk of this court, which said Motion and Affidavits are in the words and figures following, to-wit:

UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

No. 1934.

Toledo Computing Scale Company,
Appellant,

vs.

The Computing Scale Company,
Appellee.

MOTION AND AFFIDAVITS.

FRANK P. DAVIS,
EDWARD RECTOR,
Counsel for Appellant-Defendant.

Filed May 14 1913 Edward M. Holloway Clerk

UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

No. 1934.

Toledo Computing Scale Company,
Appellant,

vs.

The Computing Scale Company,
Appellee.

MOTION.

And now comes Toledo Computing Scale Company, appellant-defendant in the above-entitled cause, by its counsel, and moves the court to include in its mandate to the District Court permission to said District Court to entertain and consider, and if so advised to grant, an application of the defendant for leave to introduce proofs in said cause respecting computing scales alleged to have been manufactured and sold and introduced into use by William H. Phinney, of Pawtucket, Rhode Island, prior to the date of the invention described and claimed in the reissued letters patent in suit in said cause, and to rehear said cause on such additional proofs.

And in support of said motion, and as a basis therefor, appellant-defendant submits herewith the affidavits of Henry Theobald, Frank Parker Davis, Edward N. Pagelsen, Harry B. Sherwood, Bert W. King, Thomas Z. Phinney, E. Willard Horton, William M. Raymond, John H. Devlin, William H. Gillan, James A. Shepard, George Walker and Ralph B. Evans.

FRANK P. DAVIS,
EDWARD RECTOR,
Counsel for Appellant-Defendant.

UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company
vs.
Toledo Computing Scale Company. } In Equity. No. 30,024.

AFFIDAVIT.

County of Lucas, }
State of Ohio, } ss.

HENRY THEOBALD, being first duly sworn, deposes and says as follows:

I am 47 years of age, reside at Toledo, Ohio, and I am the president of Toledo Computing Scale Company, the defendant in the above-entitled cause. Prior to becoming president of said company in 1912, I had been for ten years the treasurer and general manager of said company, and as such thoroughly familiar with all of its affairs, including the patent litigation in which it was from time to time engaged.

In the month of March of the year 1907 the complainant in this cause, The Computing Scale Company, brought two suits against the Toledo Computing Scale Company in the United States Circuit Court at Toledo, Ohio, where the home office and place of business of said company are located, alleging infringement of the same patents sued upon in the present cause, to wit, reissued letters patent No. 11,536 and original letters patent No. 597,300. The defendant promptly filed its answers in said suits on May 6, 1907, and they were put at issue by the filing of replications on June 3, 1907. The complainant extensively advertised said suits throughout the United States, in the trade papers and by circulars and letters sent to thousands of purchasers and prospective purchasers of the defendant's scales, but took no steps whatever toward prosecuting either of said suits. It never did, at any time, make any move whatever toward the prosecution of either of said suits, but after they had been pending more than three years, to wit, on May 23, 1910, it brought the present suit in this jurisdiction for alleged infringement of the same patents. The defendant promptly filed its answer in the present suit,

and the suit was put at issue by the filing of a replication to said answer on or about August 29, 1910, but complainant took no steps toward prosecuting the suit until the following March, to wit, on or about March 15, 1911, when it applied to his Honor Judge Kohlsaat for an extension of time for the introduction of proofs, which application was granted upon condition that the complainant forthdith dismiss its aforesaid pending suits at Toledo. This was done and the prosecution of the present case subsequently proceeded with.

At the time the aforesaid suits were brought against the defendant company at Toledo, in the year 1907, I caused what I supposed to be a very thorough investigation of the prior art to be made for defenses to the patents upon which we had been sued. The patent affairs of the defendant company were at that time in the immediate charge of Mr. Allen DeVilbiss, since deceased, who was the inventor of the scales manufactured by the defendant company and was at the head of its Inventions and Patent Department. Mr. DeVilbiss and our patent counsel were instructed to spare no pains or expense in developing all available defenses to the patents upon which we had been sued, and I know that Mr. DeVilbiss made repeated trips to various parts of the country, investigating reported defenses, and that our patent attorneys had repeated investigations of the prior art made both in the Patent Office at Washington and abroad. Still later, after the present suit had been brought in this jurisdiction, we sent a man to New Mexico and to Los Angeles, California, and also to New York and Erie, Pennsylvania, to investigate scales reported to have been manufactured under the Wise patent which is in evidence in the present cause, and concerning which scales proofs were introduced. We also sent a man to Pittsburgh and Beaver Falls and to St. Louis, Missouri, to investigate other reported scales of the prior art. Altogether the defendant company spent several thousands of dollars in looking up and investigating reported defenses to the patents here in suit, and I believed and still believe that we diligently followed up every clew of which we became possessed, regardless of trouble and expense. We did not, however, learn anything respecting the manufacture of scales under the Phinney patent which is in evidence in this cause, and the first knowledge of said scales which I have ever had, and which I believe any one connected with the defendant company has ever had, came to us within the past three months, and was then due, I believe, to the wide advertising which the complainant made of

the decree which it had secured against the defendant company in the present cause, and to its suits or threatened suits against other alleged infringers of the patents involved therein. Among such suits or threatened suits was one against the Standard Computing Scale Company of Detroit, which company had a sales agent at Providence, Rhode Island, who appears to have had knowledge of some of the old scales manufactured by Phinney at Pawtucket, Rhode Island. The counsel for said company made a trip to Rhode Island to investigate the facts, and upon his return advised my company's counsel of the facts he had learned. I thereupon sent our own counsel to Rhode Island to further investigate the facts, with the result that he found them to be as reported and secured the affidavits and exhibits which are now laid before the court.

HENRY THEOBALD.

Subscribed and sworn to before me this 14th day of January, 1913.

D. H. KELLY,
(Seal.) *Notary Public, Lucas County, Ohio.*

UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company
vs.
Toledo Computing Scale Company. } In Equity. No. 30,024.

AFFIDAVIT.

State of Ohio,
County of Hamilton, } ss.

FRANK PARKER DAVIS, of lawful age, being duly sworn, deposes and says as follows:

I reside at Evanston, Illinois, and am a member of the law firm of Rector, Hibben, Davis & Macauley, of Chicago, counsel for the defendant in the above-entitled cause. I have been familiar with the patents in suit since the year 1907, at which time, in March of said year, the complainant herein brought suit against the defendant for alleged infringement of said

patents in the United States Circuit Court at Toledo, Ohio. I have had charge of the defense of the present suit subsequently brought against the defendant at Chicago and I participating in preparing for the defense of said first-mentioned suits (there were two of them). There had been made what I believed to be a very thorough and exhaustive investigation of the prior art in the Patent Office at Washington, and also careful investigation of various reported instances of prior manufacture, use and sale of scales embodying the patented inventions. The patent affairs of the defendant company were at that time in the immediate charge of Mr. Allen DeVilbiss, the inventor of the defendant's scales, who was then at the head of its Inventions and Patent Department, but is now deceased. I had frequent consultations with Mr. DeVilbiss in reference to the defense of the suits mentioned, and he was instructed to make a thorough investigation of the prior computing scale art for defense to the patents in suit. He made repeated trips to various parts of the country upon such work and reported the results of them to me. Subsequently, after the bringing of the present suit at Chicago, and after the death of Mr. DeVilbiss, still further investigations and efforts were made for the purpose of developing defenses to the patents in suit, among other things Mr. DeVilbiss's successor with the defendant company, Mr. John Burkholder, was sent by the defendant, under my direction, to New Mexico and California, New York, Erie, Pennsylvania, Dayton, Ohio, and various other places for the purpose of investigating reported instances of prior manufacture and sale of scales embodying the patented inventions. I also caused renewed investigations of the prior art to be made in the Patent Office at Washington and abroad, and among other things had the old model of the Phinney patent No. 106,869 looked up in the Patent Office to ascertain its construction, but found that it was not a full-sized working scale, but a very small model, and that its computing drum appeared to be of a solid block of wood. I had no knowledge at any time of any scales having been manufactured under or in accordance with said Phinney patent, by the patentee or any one else, nor knowledge of anything to suggest or lead me to believe that if any such scales had been constructed they differed in any way from the drawing of said patent. This was true until a period within the past three months, at which time I was advised by counsel for the Standard Computing Scale Company at Detroit that he had been informed by an agent of that company located

in Rhode Island that there had been some old scales manufactured under the Phinney patent, and that they had very light computing drums whose shells or cylinders were formed of paper. I thereupon went to Rhode Island to investigate the facts on behalf of the present defendant, and found them to be as reported. I found that William H. Phinney, the patentee, had been dead for some ten years, but I succeeded in finding his son, Thomas Z. Phinney, a man 50 years or more of age, who had been familiar with his father's invention and patent and with the scales manufactured under them, and from whom I secured an affidavit which has been filed in this case. I also learned from him that about ten years ago he and a number of other witnesses familiar with the facts relating to his fathers' old scales had been examined concerning them on behalf of the defendant in a suit which he believed to have been pending at Philadelphia, and in which, in any event, the defendant was represented by a Mr. Howson, of Philadelphia, and he exhibited to me a receipt which Mr. Howson had given him ten years ago for one of his father's old scales which he had loaned to Mr. Howson for use in said case. Upon investigation I then found that the complainant in the present case had, more than ten years ago, brought suit upon the patents involved in the present case against the Federal Scale Company, at Philadelphia, and that Mr. Phinney (the son) and others had been examined as witnesses in said suit at Pawtucket, Rhode Island, and that the prosecution of said suit had afterward been abandoned. I also learned that the complainant was represented in said suit by Mr. Melville Church, of Washington, D. C., with whom I have been personally acquainted for many years, and whom I know to have been regular eastern counsel for the complainant in this case for more than ten years past.

In the suits against the present defendant at Toledo above mentioned, the complainant was represented by Messrs. Staley & Bowman of Springfield, Ohio, who to my personal knowledge had been regular western counsel for the complainant for many years, but who have not, so far as I am aware, participated in the prosecution of the present suit against the defendant, which has been in the hands of Chicago counsel.

FRANK PARKER DAVIS.

Subscribed and sworn to before me this 14th day of January, 1913.

ALBERT C. ROSS,
(Seal.) *Notary Public, Hamilton County, Ohio.*

UNITED STATES DISTRICT COURT,
Northern District of Illinois,
Eastern Division.

The Computing Scale Company,
Complainant,
vs.
Toledo Computing Scale Company,
Defendant.
} In Equity. No. 30,024.

State of Illinois, } ss.
County of Cook. }

EDWARD N. PAGELSEN, of lawful age, being duly sworn, deposes and says as follows:

I reside at Detroit, Michigan, am an attorney at law making a specialty of patent cases, and as such am attorney and counsel for The Standard Computing Scale Company, Ltd., of Detroit, a concern engaged in the manufacture and sale of computing scales. On or about May 15, 1911, said company was sued at Milwaukee, Wisconsin, where it has an agency, by The Computing Scale Company, of Dayton, Ohio, for alleged infringement of reissued letters patent No. 11,536 and original letters patent No. 597,300, covering the inventions of Albert U. Smith in computing scales, and I was employed by The Standard Company to defend the suit. Said suit is still pending and I have continuously had charge of it on behalf of the defendant. I originally filed a plea questioning the jurisdiction of the court, upon which plea issue was joined and testimony taken. The question was submitted to his Honor, Judge Sanborn, on briefs, and after being held under advisement for a considerable time the plea was overruled, and thereafter, in July, 1912, I filed an answer to the bill, in which I set up all of the prior art defenses of which I had been able to learn. About the first of the following November, before any proofs had been taken in the case, I learned by accident that there was a man at Kansas City, Missouri, who claimed to have knowledge of some very old computing scales having paper drums or cylinders. I went at once to Kansas City, and located the man in question, who proved to be Mr. H. B. Sherwood, vice-president of the Kansas City Computing Scale Company. Mr. Sherwood told me that he had formerly lived at Saugatuck, Connecticut, and had been in the employ there of the E. C. Smith Company, manufac-

turers, among other things, of computing scales. He further told me that while so in the employ of the E. C. Smith Company, some fifteen years prior to the date of our conversation, said E. C. Smith Company had in its possession, in a collection of various old computing scales, several computing scales having paper drums or cylinders which had been manufactured by a man named Phinney somewhere in Rhode Island. Mr. Sherwood further said that he had been back and forth to Saugatuck on various occasions since leaving the employ of the E. C. Smith Company, and that on one occasion he had visited their factory and had seen these old Phinney scales stored away, along with samples of various other old computing scales, in the storeroom in the factory. He thought the scales in question were still there at the time of his conversation with me, and that he could readily secure them by going to Saugatuck. Upon my return to Detroit I consulted with my clients and secured their authority to have Mr. Sherwood go to Connecticut at their expense and endeavor to locate and secure the scales in question. I thereupon wired Mr. Sherwood at Kansas City and requested him to go to Saugatuck. He replied that he could not go immediately on account of his business at Kansas City, but a few days later wired me again stating that his mother, who lived in Saugatuck, had just died and that he would go on there at once. He returned to Kansas City by way of Detroit, and informed me that the E. C. Smith Company had gone out of business and that the old scales had all been removed from the place in their factory where he had last seen them, and could not be found.

After this unsuccessful effort to locate the old Phinney scales I had my client instruct its New England agency to have its salesmen, and particularly the one located in Rhode Island, make a search for any living members of the Phinney family. A week or two later we received word from my client's Rhode Island salesman, Mr. M. C. Shurtliff, stating that he had located a son of Mr. Phinney, the patentee of the scales in question, who was residing in Providence and had in his possession one of the old scales manufactured by his father, together with parts of others. I at once went to Providence and saw the said Phinney, and a number of other people who were familiar with the old scales, including the widow of the patentee Phinney, a woman upwards of eighty years of age, who stated to me that her husband had been dead some ten years. I secured affidavits from a number of

persons familiar with the old scales, and also procured a sample scale and one of the paper drums or cylinders from another old scale, and returned to Detroit. Shortly afterward I reported the information I had secured to counsel representing the Toledo Computing Scale Company for use in the suit which was pending against that company upon the same patents as those upon which my client had been sued.

Prior to learning by mere chance of the information which Mr. Sherwood, of Kansas City, was reported to have respecting some old computing scales having drums or cylinders made of paper, I had no knowledge that any scales of any kind had ever been manufactured under the Phinney patent nor any reason to suppose or believe that if any such scales had been manufactured they had departed in any way from the disclosure of the patent. I had been familiar with the Phinney patent for a number of years, in connection with my work for The Standard Computing Scale Company, having been attorney for that company for some four years, and having been continuously engaged in its behalf during that period in litigation over computing scale patents. I was fairly familiar with the computing scale art, and particularly with spring drum computing scales, but there was nothing about the Phinney patent to lead me to suppose or believe that, if any computing scales had been manufactured under the patent, their computing drums or cylinders had been formed of paper. On the contrary, the drawings of the patent indicated that such drum or cylinder was made of some other material, such as sheet metal, for the reason that each drum or cylinder was shown in the drawings of the patent as being composed of a single continuous and integral sheet of material, of uniform thickness, formed or shaped up into a drum or cylinder, and when I met Mr. Phinney, the son, at Providence, I learned from him that some of the old scales manufactured by his father had in fact been provided with sheet metal drums or cylinders, and that he still had one of such old scales in his possession, and I was subsequently informed that it was from this old metal cylinder scale that the drawings and application for his father's patent had been prepared.

EDWARD N. PAGELSEN.

Subscribed and sworn to before me this 5th day of May, 1913.

ROBERT DOBBERMAN,

(Seal) *Notary Public, Cook County, Illinois.*

UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company, *Complainant,*
vs.
Toledo Computing Scale Company, *Defendant.*
In Equity. No. 30,024.

State of Illinois, County of Cook, } ss.

HARRY B. SHERWOOD, being duly sworn, deposes and says as follows: I am 44 years of age, reside at Kansas City, Missouri, and am vice-president and secretary of the Kansas City Computing Scale Company (originally the Kansas City Scale and Supply Company), manufacturers of computing scales.

My home was formerly at Saugatuck, Connecticut, where I lived from the time I was an infant until I was upwards of 30 years of age, removing from Saugatuck about the year 1901, under the circumstances hereinafter related. I have known Albert U. Smith and Edmond C. Smith, named as inventor and assignee, respectively, in reissued letters patent of the United States No. 11,536 of April 28, 1896, ever since my boyhood. When I was a small boy Albert U. Smith lived at Saugatuck, Connecticut, and I knew him at that time. Later he removed to Seymour, Connecticut, some thirty or forty miles from Saugatuck, and still later moved back to Saugatuck. Edmond C. Smith was an uncle of Albert U. Smith, and was a manufacturer of shoe and rope machinery, with a factory located at Saugatuck. His residence address is given in the above-mentioned patent as Westport, Connecticut, which is practically the same town as Saugatuck. About the year 1886 I went to work for Edmond C. Smith in his shoe and rope machinery factory, and with the exception of part of one year remained continuously in his employ, and in that of his successors in business, for some fifteen years.

In 1894 or 1895 Mr. Edmond C. Smith, who had by that time largely abandoned the manufacture of shoe and rope machinery previously carried on by him, but was a man of

means, became interested in a computing scale which his nephew, Albert U. Smith, had gotten up at Seymour, Connecticut, and a few of which had been built and sold or introduced into use at Seymour. Arrangements were made between the two Smiths by which the manufacture of these scales was transferred to Saugatuck, and placed in charge there of A. U. Smith and myself in the old factory of E. C. Smith. The manufacture of the scales was carried on there for several years, first under the name of E. C. Smith & Co. and then under that of the E. C. Smith Company, after which the business was sold to the Boston Computing Scale Company, and shortly thereafter was sold by that company to the Computing Scale Company of Dayton, Ohio.

The scales which A. U. Smith had manufactured at Seymour, and perhaps some of the early ones manufactured at Saugatuck, had metal name plates affixed to them bearing the words "The Daisy Computing Scale. Pat. Feb. 18, 1890," the patent date referring to the Babcock patent No. 421,805 of February 18, 1890, under which Mr. Smith had some sort of a license or royalty arrangement. I still have one of such old name plates in my possession, among various computing scale relics which I have preserved, and submit it with this affidavit marked "Defendant's Exhibit Smith Name Plate." The later scales manufactured by the Smiths at Saugatuck were called the "Acme." The Smith scales were all similar to that illustrated and described in the Smith patent heretofore mentioned, various improvements being added from time to time.

The manufacture of the Smith scales continued to be carried on at the Saugatuck factory after the sale of the business to the Boston Computing Scale Company, and after its further sale by that company to the Dayton Company, and I remained at the Saugatuck factory, in the employ of the Dayton Company, until late in the year 1900 or early in the year 1901, at which time I became connected with a company known as the Columbian Automatic Computing Scale Company, which was organized by some gentlemen at Washington, D. C., to exploit a computing scale gotten up and patented by a man named Christopher. I was placed in charge of the manufacture of the scales, including the establishment of a factory, which was finally located at Philadelphia, and the manufacture of the scales begun there, but later on transferred to Bridgeport, Connecticut. In addition to the company above mentioned, which had been organized for the

manufacture of the Christopher scale (and whose name was subsequently changed to that of Automatic Computing Scale Company), there was a selling company organized under the name of the Federal Scale Company, and this company undertook the marketing of the scales. Shortly after the scales were placed upon the market this latter company was sued, in the United States Court at Philadelphia, by the Computing Scale Company, of Dayton, Ohio, for infringement of the Smith reissued patent No. 11,536 heretofore referred to, and I assisted the company's attorneys in preparing for the defense of the case. I was familiar with the fact that one William H. Phinney, of Pawtucket, Rhode Island, had manufactured some computing scales at an early date, which had light cylinders or drums composed of paper shells and wooden end pieces or heads mounted on a rotary shaft or spindle. One of these Phinney scales had been discovered by a salesman of the Smith scales, in a store or market at Pawtucket, Rhode Island, soon after the Smith scales were placed upon the market, in 1894 or 1895, and had been brought by him to the Smith factory at Saugatuck, where I had seen and examined it at that time. I told the attorneys who were defending the suit against the Federal Scale Company about this old Phinney scale, and they sent a man to Rhode Island to make an investigation, with the result that they secured several similar scales of Phinney's manufacture which had long been in use there, and they were introduced in evidence and a number of witnesses examined respecting them, after which the suit was abandoned by the Dayton Company.

I repeatedly saw these old Phinney scales in the possession of Messrs. Howson & Howson, attorneys for the Federal Scale Company at Philadelphia. They were all quite similar to the old Phinney scale which I had seen at Saugatuck, although differing somewhat in details from it and from each other. The old Phinney scale which I saw at Saugatuck had a wooden case and was substantially identical in appearance with that shown in the circular marked "Defendant's Exhibit Phinney Circular" attached to the affidavit of Thomas Z. Phinney in this case. It was arranged to rest on a shelf, which was provided with a hole through which the depending rod or bar carrying the hook for the suspension of the scale-pan extended, as shown in said circular. Others of said old Phinney scales had metal casings, and were substantially identical in appearance with that shown in the cut attached to the affidavit of William M. Raymond in this case. All of

them were provided with light drums or cylinders composed of paper shells and wooden end pieces or heads substantially identical with the drum or cylinder shown in the cut attached to Mr. Raymond's affidavit above mentioned. The scales were of various sizes, as I recall them, with drums or cylinders of corresponding sizes, and they all operated in the manner disclosed in the Phinney patent No. 106,869 of August 30, 1870.

HARRY B. SHERWOOD.

Subscribed and sworn to before me this 12th day of May, 1913.

ROBERT DOBBERMAN,
Notary Public.

(Seal)

UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company, *Complainant,*
vs.
Toledo Computing Scale Company, *Defendant.*
} In Equity. No. 30,024.

State of Michigan, } ss.
County of Wayne, }

BERT W. KING, of lawful age, being duly sworn, deposes and says as follows:

I reside at Detroit, Michigan, and am in the employ of the Standard Computing Scale Company, Limited, of Detroit, manufacturers of computing scales. I have been in the employ of that company continuously since June 1, 1909, and prior to that date I was in the employ of The Computing Scale Company of Dayton, Ohio, complainant in the above entitled cause. I have been connected with the manufacture of scales for the past eighteen years, and during my employment by The Computing Scale Company of Dayton, Ohio, I had charge of the final tests of the computing scales manufactured by said company, by which their adjustment and accuracy were determined. While I was in the employ of

said last mentioned company, at Dayton, Ohio, it had in its possession a number of old computing scales, not manufactured by that company, which scales were provided with very light drums or cylinders composed of cylindrical paper shells and wooden end pieces mounted upon a shaft or spindle, the surfaces of the paper cylinders being provided with circumferential rows of figures to indicate the weights of the articles placed on the pan of the scale and the value of such articles at various prices per pound or ounce. On one occasion, about a year before leaving the employ of The Computing Scale Company, I was directed to adjust one of said scales and put it in proper order for accurate weighing and price-computation, and did so. The scale in question had a cast iron body in which was mounted a rotatable shaft or spindle to which was secured two light drums or cylinders such as those above described, the ends or heads of the drums or cylinders being composed of thin pieces of wood partially cut away to still further lighten them, and having cylindrical paper shells secured to and carried by them. A pinion was fastened upon the shaft or spindle between the two drums, and this pinion was engaged by a rack connected at its upper end with a coiled spring and having the scale pan suspended from its lower end. At the time I adjusted the particular scale which I have mentioned there were at least three other old scales, apparently identical with it, hanging up in the experimental room of The Computing Scale Company at Dayton. All of these scales were substantially identical, in form and appearance, with the scale shown in letters patent No. 106,869 of August 30, 1870, to W. H. Phinney, and the one which I adjusted was substantially identical in construction with the scale disclosed in said Phinney patent, with the exception of its computing drums or cylinders, which latter were constructed in the manner above described. I had no occasion to examine the interior construction of any of the other scales of similar form and appearance which I have stated were in the experimental room of the Dayton Company at the same time, but there was nothing in their form or appearance to indicate that they differed in any way from the particular scale which I adjusted.

I have examined the computing scale referred to in the affidavit of Thomas Z. Phinney in this case, and marked "Phinney Exhibit Sample Scale," and find that said scale is substantially identical in every respect with the old scales which I saw in the experimental room of The Computing

Scale Company at Dayton, Ohio, and one of which I adjusted as above described. I have also examined the drum or cylinder referred to in the affidavit of said Phinney and marked "Phinney Exhibit Original Drum," and find that said drum or cylinder is identical with the drums or cylinders of the old scale which I took apart and adjusted at Dayton at the time above mentioned.

BERT W. KING.

Subscribed and sworn to before me this 7th day of May, 1913.

HUGO W. KREINBRING,
((Seal.) *Notary Public, Wayne County, Michigan.*

UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company, *Complainant*, vs. Toledo Computing Scale Company, *Defendant*. } In Equity. No. 30,024.

AFFIDAVIT OF T. Z. PHINNEY.

State of Rhode Island, } County of Providence. }

THOMAS Z. PHINNEY, being duly sworn, says as follows:

I am 52 years old, and the son of William H. Phinney, of Pawtucket, R. I., patentee of patent No. 106,869, dated August 30, 1870, for "Scale for Showing Weight and Price." My father died in August, 1902; about ten years prior to his death he turned over to me a business he had been conducting for some twenty years, which consisted in the manufacture and sale of weighing and computing scales, corresponding substantially with the construction shown in said patent. The manufacture of these scales was carried on during that period, and for some considerable time subsequent thereto, when he had turned the business over to me, in a shop at the

rear of my father's home in Pawtucket, R. I. I had assisted my father in the assembling of the scales during the period of twenty years referred to and I have personal knowledge and a clear recollection of the makeup of the scales which were assembled in that shop during said period, and also with reference to the exhibition of those scales at various places, and the sale of several of them to storekeepers and provision venders, who regularly used them in weighing and computing values of the commodities in which they dealt.

I have in my possession the original full-sized scale which my father built, and from which the drawings of his said patent were made. This original scale corresponds precisely with the construction illustrated in said patent. It has a wooden casing and contains a pair of drums or cylinders of hollow metal, with paper charts pasted over their cylindrical portions. I recall the model which was sent to the Patent Office—a duplicate of which is now in the possession of my mother—and has drums or cylinders of solid wood. This form of drum or cylinder was not followed in any of the scales which my father or I built for sale, neither was the hollow metal form of cylinder followed in any but a very few of those scales. For the purpose of securing lightness of the drums and increased sensitiveness of the scales, my father adopted a form of drum which consisted in heads or end disks of comparatively thin wood cut out in skeleton or spider form, and a cylindrical shell of paper without any metallic or wood backing, except as the marginal portions of the shell embraced the edges of the heads or end disks, to which the shell was glued. Some of the scales which were made by my father had wooden casings, but the most of them had cast-iron casings.

The scale marked for identification "Phinney Exhibit Sample Scale," is just such a scale as my father manufactured in considerable quantity during a period of twenty years heretofore referred to. In fact, this exhibit scale was assembled by me out of parts which my father turned over to me when I succeeded to the business more than twenty years ago. I assembled this exhibit scale about ten years ago. The occasion for my doing so was that the only complete working scale of this type which I then had and which I had been regularly employing in my business of manufacturing and selling pop-corn flakes, was loaned by me to one Charles Howson, a Philadelphia lawyer, who borrowed it for an indefinite period to use in connection with some patent litigation. I as-

sembled the exhibit scale for use in my above mentioned business in place of the scale I loaned Mr. Howson. This scale which I loaned Mr. Howson corresponds in all essential respects with the exhibit scale, though I recall it had a casing which was made of sheet brass. It had just the same sort of indicating drums that are in the exhibit scale. I had assembled this scale with the brass casing more than twenty years ago.

The cast iron casing of the exhibit scale is composed of the cast iron patterns which were used from time to time during the twenty years period prior to my succeeding to my father's business, for the casting of other iron casings which were used for scales that he made and sold.

After succeeding to my father's scale business I did not make or have made for me any parts for scales, but I did assemble out of the parts which my father turned over to me as many as three complete scales which I sold. I still have in my possession a considerable number of the scale parts which were turned over to me more than twenty years ago by my father, and these include several complete indicating drums, each composed of skeleton end disks or heads of wood, and have a cylindrical shell of paper. The drum marked for identification "Phinney Exhibit Original Drum" is one of the drums turned over to me by my father more than twenty years ago, and the others that I have in my possession are just like it. My recollection is that this exhibit drum was originally part of the scale which my father sold to one Raymond, a butcher who traveled about selling meats from a cart. I recall the use of the scale by said Raymond more than thirty years ago, and I recall the circumstance that the scale was broken through some accident and Raymond brought it to my father's shop and procured another. Raymond is still living and resides in South Attleboro, Mass.

Others I recall who purchased and used scales made by my father were John H. Devlin and Daniel Horton, both of whom dealt in meats, provisions and groceries in the City of Pawtucket, R. I., prior to the year 1880, and prior thereto used said scales for weighing and computing commodities in which they dealt.

I have examined a diary kept by my father and find therein notation of sale of a scale to said Horton October 29, 1878, and also an entry dated August 20, 1873, which refers to installing a scale in Devlin's market. I also found in said diary

notation of a scale sent to England in 1873, through one J. Hill; also a notation of a trip to Providence in 1874 to sell scales; also notation of the sale of a scale January 1, 1881, to Dexter's market in Providence, R. I., and a sale January 8, 1881, to 223 Cranston street, Providence, R. I., without name of proprietor. I also find in my father's diary notations concerning various exhibits of the scale at business places and fairs and the awarding of a diploma by New England Fair, December 16, 1873.

I recall the advertising circular which my father distributed and several of which have been preserved, one of the same being attached hereto, and marked for identification, "Defendant's Exhibit Phinney's Circular." This has been in my possession for upwards of thirty years, and illustrates a form of casing which differs slightly from that of most of the scales which he made and sold. I recall that he preferred the style of casing which the "Phinney Exhibit Sample Scale" has, the casing of the latter, as before stated, having generally served as a pattern from which to cast casings for other scales.

I recall that all of these scales which were made by my father for exhibition at business places and fairs and for sale were constructed upon identically the same principle as the scale illustrated in my father's patent and practically all of them had indicating drums composed of skeleton wood heads and paper cylindrical shells the same as "Phinney Exhibit Original Drum" and the drums in "Phinney Exhibit Sample Scale." I recall that my father adopted this construction of drum at an early period and all the drums he turned over to me more than twenty years ago were of this description.

I further recall that the scales which my father sold were regularly sealed, i. e., tested for accuracy and sensitiveness by the official sealer of weights and measures of the city of Pawtucket, R. I.

I was a boy when my father's business in these scales started, but my familiarity with the enterprise dates back to that time. His shop was on the premises of our home and the various members of the family were in and out of the shop constantly and greatly interested in the work that was going on there, and we all assisted my father in it, and I continued to assist my father right along for many years, and I traveled about with him frequently when he was exhibiting and endeavoring to sell his scales, and I was identified with

him in his business from the time it started up to the time when he turned it over to me.

The three scales I before mentioned as having been assembled by me out of parts turned over to me by my father, were sold one at a time to the same individual, whose identity I do not know. Some fifteen years ago he first applied for a scale, representing to me that he was from Connecticut and desired the scale for the uses of the Grocers & Butchers' Association of Connecticut. About a year after I sold this individual a scale (which scale was substantially identical with "Phinney's Exhibit Sample Scale"), he appeared again and I sold him a second scale of this same kind. Upon this occasion I recall that I asked him if he hadn't taken the first scale up to Boston and used it in connection with the business of the Boston Computing Scale Co. He admitted that he had some connection with that company, but stated that he was out of it and wanted another scale to use in some other connection. I sold him one, and he returned again about a year later and I sold him a third scale. This was the last scale I disposed of to the best of my recollection up to the time about ten years ago when I loaned Mr. Howson the scale that I had kept for my own use as aforesaid. I have never seen this latter scale since that time and I still hold the receipt given me by Mr. Howson, dated April 2, 1902.

I have recently made repeated efforts to locate one of the scales which were put in regular use at places of business where my father sold them, but I have been unable to locate a single one of them. I believe they were all gathered up some ten years ago in connection with the same litigation with reference to which I loaned Mr. Howson my scale, for I recall seeing in Mr. Howson's possession a dry-goods box containing a collection of scales and scale parts which I recognized as those of my father's manufacture. This was at a time when my mother, my wife and myself and, I think, John H. Devlin, son of the aforesaid John Devlin, and William H. Gillan were called to testify in the litigation. I have no knowledge as to the outcome of that litigation, though I do recall that upon the occasion when the aforesaid testimony was taken, one of the attorneys remarked to me that the case would never come to trial. I do not recall who the parties to that litigation were, though I retain an impression that there were Dayton, Ohio, and Philadelphia, Pa., and New Britian, Conn., concerns involved in it.

THOMAS Z. PHINNEY.

Subscribed and sworn to before me at Providence, R. I., this 2nd day of January, 1913.

(Seal.) JAMES H. THURSTON,
Notary Public.

UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company, *Complainant,*
vs.
Toledo Computing Scale Company, *Defendant.*
In Equity. No. 30,024.

AFFIDAVIT E. WILLARD HORTON.

State of Rhode Island, } ss.
County of Providence, }

E. WILLARD HORTON, being duly sworn, deposes and says as follows:

I am fifty-three years old and reside at 26 Allen avenue, City of Pawtucket, County of Providence, and State of Rhode Island. I was a neighbor and very friendly with Thomas Z. Phinney, son of William H. Phinney, of said Pawtucket, and was constantly running back and forth from my home to Mr. Phinney's shop where he formerly made the Phinney self-reckoning scale, so-called in U. S. patent No. 106,869, issued August 30, 1870. I was very much interested in watching the making of these scales so that I remember distinctly how they were made. I remember that some of the first had wooden casings, but that the rest had an iron casing. The drums on which the figures which gave the weight and the amount of purchase were printed, were made of wood and metal ends having holes through them and the paper tube with the figures was pasted on these wooden ends. The drum was mounted to revolve in the casing.

I distinctly remember of diplomas being awarded to Mr. Phinney at different fairs where he had exhibited his self-reckoning scales. I also recollect him selling scales con-

structed as above set forth to Daniel Horton, of Pawtucket, R. I., and that the scale was in constant use for a long time in Horton's store at Pine street. Mr. Horton died a few months ago. I know that Mr. Phinney also sold one of these scales to John H. Devlin on River street, Pawtucket, R. I., who also used this scale in his market.

E. WILLARD HORTON.

Subscribed and sworn to before me at Pawtucket, R. I., this 2nd day of January, 1913.

FELIX F. THURM,
Notary Public.

UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company, *Complainant,*
vs.
Toledo Computing Scale Company, *Defendant.*
} In Equity. No. 30,024.

AFFIDAVIT OF WILLIAM M. RAYMOND.

State of Rhode Island, } ss.
County of Providence, }

WILLIAM M. RAYMOND, being duly sworn, deposes and says:

I am eighty-eight years old and reside at No. 43 Washington street, in the village of South Attleboro, Town of Attleboro, County of Bristol, and State of Massachusetts.

For a period of about twenty years, dating approximately between the years 1872 and 1892 I was engaged in the butcher business in the City of Pawtucket, R. I., the first of the period running a butcher's cart and later running a market.

Over thirty years ago I purchased from William H. Phinney a new form of scale which I had heard that he was manufacturing. This scale was a self-reckoning scale, as it was provided with a drum carrying a list of figures which showed not only the weight, but the price of the article weighed.

The scale I purchased from Mr. Phinney consisted of a drum which revolved in a cast-iron casing. The drum was hollow and had two wooden ends which had holes through them, and there was a cylindrical tube of paper extending between these ends, and upon the outside of the paper were the figures which gave the weight and price. The scale was just like the one shown in the attached photograph.

I used the scale about five years, about four years of which I used it on my cart and the last year in a store which I opened at the corner of Japonica and Fountain streets in the Pleasant View section of Pawtucket, R. I., and all the time I used it the scale worked beautifully and accurately.

I paid Mr. Phinney $10.00 for the scale when I first purchased it from him, and I sold the scale, together with my business, to a Mr. Hiram W. Shaw.

I know that John H. Devlin used one of Mr. Phinney's scales like mine at the same time I was using mine.

WILLIAM M. RAYMOND.

Subscribed and sworn to before me at Providence, R. I., this 2nd day of January, 1913.

JAMES H. THURSTON,
Notary Public.

UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company, *Complainant,*
vs.
Toledo Computing Scale Company, *Defendant.*
} In Equity. No. 30024.

AFFIDAVIT OF JOHN H. DELVIN.

State of Rhode Island, } ss.
County of Providence. }

JOHN H. DEVLIN, being duly sworn, says as follows:

I am sixty-seven years of age, a resident of Pawtucket, R. I., and a son of John Devlin, who died some twelve years ago. He had operated a meat and provision market at 78 River street, Pawtucket, R. I. I succeeded him as proprietor of this shop about twenty-six years ago, having previously assisted my father in carrying on the business. I remember that there was in use in the store at the time I succeeded my father a weighing and computing scale known as the Phinney scale, and similar in make-up and mode of operation to "Phinney Exhibit Sample Scale." I remember that the casing was wood and somewhat different in design from that of exhibit scale, but in all other respects it was substantially identical therewith. I used this scale regularly in the business for a period of ten years, for weighing and computing the values of various commodities, then I sold the business to Frank Mitchell.

JOHN H. DEVLIN.

Subscribed and sworn to before me at Pawtucket, R. I., this 2nd day of January, A. D. 1913.

FELIX F. THURM,
Notary Public.

UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company, *Complainant*,
vs.
Toledo Computing Scale Company, *Defendant*.
} In Equity. No. 30024.

AFFIDAVIT OF WILLIAM H. GILLAN.

State of Rhode Island, } ss.
County of Providence. }

WILLIAM H. GILLAN, being duly sworn, says as follows:

I am 44 years of age, and a resident of Pawtucket, R. I. I am the proprietor of the meat and provision store located at 78 River street, Pawtucket, R. I. I bought this business from John H. Devlin about twelve years ago. I had worked as an employee of Devlin in said store for about seventeen years, and before that as an employee of John H. Devlin, who was the proprietor of the store. I recall that during the time I was working in that store and fully twenty-five years ago there was regularly employed in the weighing and computing of values of meats and provisions, a scale which was known as Phinney's scale. I used this repeatedly myself, and continued to do so up to about ten years ago, when some person whose identify I do not now recall purchased the scale from John H. Devlin. I recall this incident, however, as connected in some way with litigation, and I think the person who bought the scale from Devlin was one of the attorneys who took part in the taking of some testimony about that time. I was one of the witnesses and I remember that besides the scale I had turned over to said attorney there were a number of others in his possession, all of the same make that is, Phinney scales.

During the time I worked in Devlin's and Fallon's store, and was myself the proprietor of that store, I became very familiar with the Phinney scale in use there, both through my frequent use of it and through examination of its interior

construction. It corresponded in all essential respects with Phinney's Exhibit Sample Scale, the only difference that I can recall being that it had a wooden casing of somewhat different design, instead of the iron casing of the exhibit scale. It had identically the same arrangement of a horizontal sight opening or slot across the front of the casing, and there were price per lb. numerals marked along this slot on the casing. The casing also bore the name William H. Phinney, and the date of his patent. There was in this scale the same arrangement as in the exhibit scale of a spring in the upper part of the casing and a bar suspended from the spring and cut with gear teeth, which engaged a gear wheel. Furthermore, the construction was identical with that of the exhibit scale with respect to the location of that gear wheel between the drums. The drums and the gear wheel were fastened together as in the exhibit scale, so that when goods were placed upon the pan which hung from the lower end of the bar, the drums would turn within the casing, and weight and value numerals would be exhibited through the slot of the casing. I had occasion more than once to inspect the interior mechanism of the scale so used in Devlin's and afterwards Fallon's and later my store, and I recall distinctly that the indicating drums and wooden hubs which were fastened upon a metal rod that was held between bearings on the casing, the same as in the exhibit scale. I further recall that each of these drums was identical in construction with the "Phinney Exhibit Original Drum," in that each was composed of skeleton end disks or heads of wood and a cylindrical shell of paper.

WILLIAM H. GILLAN.

Subscribed and sworn to before me at Pawtucket, R. I., this 2nd day of January, A. D. 1913.

FELIX F. THURM,
Notary Public.

UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company, *Complainant*, *vs.* Toledo Computing Scale Company, *Defendant.* } In Equity. No. 30024.

AFFIDAVIT OF JAMES SHEPARD.

JAMES SHEPARD, being duly sworn, deposes and says as follows:

My name is James Shepard; age, 74 years; residence, 139 Lake street, New Britain, Connecticut; occupation, solicitor of patents and expert in causes appertaining to patents. I have been a solicitor of patents since 1866 and have frequently testified as an expert since 1873. Some time in 1901 or 1902, I cannot give the precise date, I was employed by Landers, Frary & Clark as expert in a cause on computing scales brought, I believe, by The Computing Scale Company of Dayton, Ohio. In connection therewith I requested Mr. Samuel R. Munson, then their superintendent, to secure for use in that case a sample of the computing scale as made by one Phinney of Providence, R. I., under an old patent. This resulted in the production of two old computing scales which were first brought to the factory of Landers, Frary & Clark and later sent to Messrs. Mitchell, Bartlett & Brownell, of New York, who were counsel for Landers, Frary & Clark. I have read the affidavit of George Walker in the above-entitled cause and the two scales which he refers to therein are the scales which were procured in response to my request of Mr. Munson. They were made in substantial accordance with an old patent to one Phinney, the shell of the indicating drum being made of paper, which material, as I remember, is not mentioned in the said Phinney patent. I remember these scales distinctly and I believe that Mr. Walker's description of them in his affidavit is correct. I have recently visited the factory of Landers, Frary & Clark for the purpose of obtaining the old Phinney scales from them and was in-

formed that they were destroyed, with the exception of the shaft brackets mentioned in Mr. Walker's affidavit.

JAMES SHEPARD.

Subscribed and sworn to before me, a Notary Public, this first day of January, 1913.

HERMAN LUMPP,
Notary Public.

UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company, *Complainant,*
vs.
Toledo Computing Scale Company, *Defendant.*
} In Equity. No. 30024.

AFFIDAVIT OF GEORGE WALKER.

GEORGE WALKER, being duly sworn, deposes and says as follows:

My name is George Walker; age, 53 years; residence, 119 Dwight street, New Britain, Connecticut; occupation, scale expert for Landers, Frary & Clark, of New Britain aforesaid. I have been in the employ of the said corporation since September, 1900. About a year or two after I entered their employ, two computing scales were brought to the factory for use in defense in a patent case then pending, or threatened, which scales I was informed and believe were old scales which came from a son of an old scale maker of Providence, R. I. Each of these scales had a case the base of which was in the form of a round-topped box from the middle of which at the top was an upright extension which enclosed a counterbalancing spring. The lower part of the case had mounted therein a horizontal shaft carrying a divided drum and a pinion between the two sections of the drum. The shaft was actuated by a rack, attached to a draw bar, properly connected with the counterbalancing spring and in engagement with the said pinion. The drums were made of paper

shells and wooden end pieces or heads, the shells having a computing table printed thereon for indicating the amount and cost through suitable openings in the case. The case of one scale was made of wood and that for the other scale was of metal. The shaft for the pinion and indicating drum, in the scale having the wooden case, was mounted in a pair of metal brackets secured within the case. I herewith produce the said brackets, which are marked "Exhibit Old Scale Brackets," together with the name of this cause. Both of the said two scales were, soon after being procured, sent from the Landers, Frary & Clark factory, as I am informed and believe, to Messrs. Mitchell, Bartlett & Brownell of New York City, where they remained for some time. They were finally returned to the factory and placed in my possession. They remained in my room until about July, 1912, when I moved into a new factory building. Before moving I was ordered by an officer of Landers, Frary & Clark to clear out all the old things from my room and put them into the scrap heap. I knocked the scale having the wooden case to pieces, but saved the journal brackets herein before produced and marked "Exhibit Old Case Brackets." All the other parts of the scale and the scale with the metal case were placed in the scrap heap and I have not seen them since.

GEORGE WALKER.

Subscribed and sworn to before me, a Notary Public, this first day of January, 1913.

HERMAN LUMPP,
Notary Public.

UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

The Computing Scale Company, *Complainant,*
vs.
Toledo Computing Scale Company, *Defendant.*
In Equity. No. 30,024.

AFFIDAVIT.

State of Pennsylvania, } ss.
County of Philadelphia, }

RALPH B. EVANS, of lawful age, being duly sworn, deposes and says as follows:

I reside at Philadelphia and I am an attorney at law. Within the past ten days I have, at the request of Edward Rector of Chicago, Illinois, examined the docket and files of the United States Circuit Court for the Eastern District of Pennsylvania, for the purpose of ascertaining what they might disclose with respect to a suit for infringement of certain letters patent reported to have been filed in said court about the year 1901 by The Computing Scale System of Dayton, Ohio, against the Federal Scale Company, of Philadelphia. Upon examining the docket and files of said court pursuant to said request, I found that such a suit was brought in said court as of October Sessions 1901, No. 12, on October 5, 1901, alleging infringement of certain letters patent No. 11,536, dated April 28, 1896, and original letters patent No. 597,300, dated January 11, 1898, and praying an injunction and an accounting of profits and damages against the defendant. An answer was filed in said suit on or about December 16, 1901, setting up, among other defenses, letters patent of United States No. 106,869, granted August 30, 1870, to William H. Phinney, and also an alleged prior invention and use by the said Phinney of scales embodying the inventions of the patents sued upon. Replication was filed to said answer, but no proofs were ever filed in the cause, and so far as the records of the court show it was abandoned without any prose-

cution. The bill of complaint was signed by Messrs. Church & Church, of Washington, D. C., as solicitors and counsel for complainant, and the answer by Mr. E. Miller Jackson, of Washington, D. C., and Mr. Charles Howson, of Philadelphia, as solicitors and counsel for defendant.

Upon calling at the office of Mr. Charles Howson in Philadelphia and making further inquiry about the suit in question I was informed by him that by stipulation between counsel the proofs and exhibits were not filed of record, but were left in the custody of the counsel for the party on whose behalf they were presented. I examined the proofs taken on behalf of the defendant, the original of which are still in the possession of Mr. Charles Howson. Among the defendant's proofs are depositions of William H. Phinney, Elma Owen Phinney, John H. Devlin, Thomas E. Phinney, William H. Gillan, Daniel H. Horton and Myra Phinney, taken before Waldo W. Robinson, 210 Main street, Pawtucket, Rhode Island, between May 2 and May 10, 1902. The record shows that the complainant was represented at the taking of their depositions by Mr. Melville Church, of Washington, D. C., and defendant by Messrs. Howson and Howson of Philadelphia. These depositions show the manufacture and sale by Phinney of certain scales, manufactured under his patent above mentioned, and three of these scales were produced and introduced in evidence.

I was informed by Mr. Howson that subsequent to the taking of these depositions the exhibits were turned over to Mr. Church, in whose custody they have been until within the past ten days, when they were returned to Mr. Howson at the latter's request. Mr. Howson further stated that after the taking of the depositions above referred to the complainant took the deposition of one witness, not, however, bearing upon this effect of the old Phinney scales, but relating to another defense, and that since that time no further proceedings have been taken in the case, although to the best of his knowledge no settlement was ever effected.

RALPH B. EVANS.

Sworn and subscribed to before me this 15th day of January, 1913.

(Seal)

CHARLES J. McDERMOTT,
Notary Public.

And afterwards, on the same day, to-wit: On the fourteenth day of May, 1913, in the October term last aforesaid, the following further proceedings were had and entered of record, to-wit: Order May

Wednesday, May 14, 1913.

Court met pursuant to adjournment and was opened by proclamation of crier.

Present:

Hon. Francis E. Baker, Circuit Judge, presiding.
Hon. William H. Seaman, Circuit Judge.
Hon. George A. Carpenter, District Judge.
Edward M. Holloway, Clerk.
Luman T. Hoy, Marshal.

The Toledo Computing Scale Company
1934 *vs.*
The Computing Scale Company

Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.

Now this day come the parties by their counsel and counsel for appellant presents a motion that this court include in its mandate permission to the District Court to entertain and consider, and if so advised to grant an application of the defendant for leave to introduce proofs in said cause respecting computing scales alleged to have been manufactured and sold and introduced into use by William H. Phinney of Pawtucket, Rhode Island, prior to the date of the invention described and claimed in the reissued letters patent in suit in said cause, and to rehear said cause on such additional proofs, and also presents affidavits in support of said motion.

And the court having heard the oral arguments of Mr. Edward Rector, counsel for appellant in support of said motion, and by Mr. Thomas F. Sheridan, counsel for appellee, in opposition thereto, and now being fully advised, it is now here ordered that the said motion be, and the same is hereby denied.

And afterwards, on the same day, to-wit: On the fourteenth day of May, 1913, in the October term last aforesaid, there was filed in the office of the clerk of this court a certain Petition for Rehearing, which said Petition for Rehearing is in the words and figures following, to-wit:

14. UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

No. 1934.

Toledo Computing Scale Company,
Appellant-Defendant,
vs.
The Computing Scale Company,
Appellee-Complainant.

PETITION FOR REHEARING.

FRANK P. DAVIS,
EDWARD RECTOR,
Counsel for Appellant-Defendant.

Filed May 14 1913 Edward M. Holloway Clerk.

UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

No. 1934.

Toledo Computing Scale Company,
Appellant-Defendant,
vs.
The Computing Scale Company,
Appellee-Complainant.

PETITION FOR REHEARING.

To the Honorable, the Judges of the United States Circuit Court of Appeals for the Seventh Judicial Circuit:

Now comes Toledo Computing Scale Company, appellant-defendant in the above-entitled cause, and believing, and

therefore respectfully representing, that the court has been led to an erroneous conclusion and decision in said cause respecting the validity of the reissued letters patent in suit therein, by reason of a misconception of the facts disclosed by the record in said cause, respectfully prays that the court may reconsider and rehear said cause, in order that its decision may be corrected and justice be done in the premises.

And your petitioner further represents and shows that the court has been misled, and has reached an erroneous conclusion, respecting the facts disclosed by the record in said cause in the following particulars, among others:

1. The court erroneously found and held that

"In this record the greatest thing is the fact that Smith put in the hands of the world's vendors of commodities the first usable automatic computing scale."

—whereas there was no issue in said cause respecting such fact, and no sufficient proof in the record to support such a finding. On the contrary, the issue in said cause was confined to an automatic computing scale of a particular type, to-wit, one employing a rotary computing drum or cylinder, as distinguished from automatic computing scales, of which there are many types upon the market and in extensive use, which do not employ such rotary computing drums or cylinders. The proofs in the case were directed to the novelty and patentability of the particular type of automatic computing scale disclosed in the Smith patent, and not to the question as to who may have been the first person in the art to have produced a "usable automatic computing scale" generally and without regard to type or construction. (Hopkinson, Record, pp. 66, 67, 69, Ans. 2, 6, 7, 10, 12; Ludlow, pp. 80, 81, 83, Ans. 3, 4, 9, 14; Chaffee, pp. 105, 106, Ans. 54, 55, 57, 58-64; Russell, pp. 128-130, Ans. 38-56; Culmer, pp. 146-148, Ans. 45-52, p. 154, Ans. 77-78, p. 155, statements of complainant's counsel, Mr. Scott; Hapgood, p. 177, Ans. 53-56; Milburn, pp. 370-371, Ans. 87-92; Cross, p. 470, Ans. 61.) Indeed, it incidentally appears from the record that there were in fact other types of automatic computing scales in commercial use prior to the Smith scale, although the proofs are not clear or extended upon this point. (Culmer, Record, p. 147, Ans. 49-52; pp. 154-155, Ans. 77-81, and statements of complainant's counsel, Mr. Scott, on p. 155.)

2. The court erroneously found and held, with respect to the Phinney and Babcock patents, that

"When those disclosures were given material bodies, failure was the result. Just as Smith said in his specification, they would not work twice alike, they were not reliable."
—whereas the record contains no proof that any one ever constructed a scale in accordance with either the Phinney or the Babcock patent, much less that any such scales were constructed and proved to be failures. It is assumed that the supposed basis for the finding of the court is in the testimony of Mr. Culmer (Record, p. 148) to the effect that he at one time attempted to build an automatic computing scale of the character of that disclosed in the Phinney patent, and was unsuccessful; but he admits that the scale constructed by him was materially different from that disclosed in the Phinney patent, without explaining what the differences were. Indeed, at page 150 of the Record (Ans. 64) he testifies that the computing drum or cylinder of the scale which he constructed was built in accordance with the computing drums or cylinders of prior non-automatic computing scales manufactured by him and known as the "Domestic"—and these drums or cylinders were quite different from those of the Phinney patent, as his testimony respecting them shows.

So far as concerns the finding that the scales supposed to have been constructed in accordance with the Phinney and Babcock patents "would not work twice alike," the record shows (Hapgood, pp. 282-284, Ans. 10-25) that many of the early Smith scales, manufactured at Saugatuck under the Smith patent in suit, were inaccurate in operation to the extent of from one-quarter to half an ounce. See also Toledo Computing Scale Co. v. Computing Scale Co., 142 Fed. Rep., 919, and Moneyweight Scale Co. v. McBride, 199 Mass., 503.

3. The court erroneously found and held that the earlier inventors and manufacturers of computing scales realized that "a tremendous commercial success was awaiting a reliable automatic computing scale," which none of them prior to Smith was able to supply; whereas the Record does not contain proofs sufficient to support such a finding, and on the contrary shows that for years after the Smith scales were placed upon the market the demand for and sale of them was exceedingly limited. Less than one hundred of them appear to have been sold during the two years or more in which the scales were manufactured by the Smiths, prior to the sale of their business to the Boston Computing Scale Company in the year 1897. (Bell, pp. 522-523; Ans. 16; pp. 533-534, Ans. 80-82.) Moreover, it appears from the testimony

of Mr. Bell, treasurer of the Boston Computing Scale Company, that the Smith scales were sold by that company at about one-third the price of other computing scales then upon the market (p. 538, Ans. 107-108). See also, on this point, Toledo Computing Scale Co. v. Computing Scale Co., and Moneyweight Scale Co. v. McBride, supra.

4. The court erroneously found and held that

"It remained for Smith to discover that the most essential thing in reorganizing the old elements was to make the drum so light that its interference with the weighing operation would be eliminated."

—whereas the record shows (or shows nothing to the contrary) that other features of the Smith scale, described and claimed in the patent in suit, may have contributed fully as much to the success of Smith's commercial scale as did the light drum or cylinder. Indeed, the witness Culmer, who testified to his unsuccessful effort to produce a satisfactory automatic computing scale of the drum or cylinder type, employed a light drum or cylinder formed of paper, but because of other defects in the construction of his scale did not achieve success. (Culmer, p. 139, Ans. 16; p. 148, Ans. 54; p. 150, Ans. 64.) Furthermore, the file-wrapper of the later Smith patent No. 674,883 (Record, pp. 715-774) shows (p. 756) that the disclosure of the Smith reissued patent, in respect to the construction of the light drum or cylinder, amounted to little more than an incomplete or impracticable suggestion, which had to be completed or made practicable for commercial use by the improvements covered by the later patent. Indeed, this later patent (Record, p. 1063) contains some twenty-eight claims, covering a variety of improvements embodied in the Smith commercial scale, which were not disclosed or suggested in the reissued patent in suit, and many of which undoubtedly contributed materially to such success as the scale had.

5. The court erroneously found and held that the Smith reissued patent was not void for indefiniteness because in his specification

"Smith substantially told those skilled in the art to make the skeleton frame to the last degree of thinness that would support the cylinder, and to make the cylinder of the very thinnest paper they could then or thereafter find in the market, which would be stiff enough to retain its shape when attached to the frame."

—whereas, if any such directions or instructions can be read

out of the Smith patent, the record shows they never have in fact been followed by Smith or any one else in the manufacture of automatic computing scales of this character. On the contrary, the testimony of Mr. Bell, of the Boston Computing Scale Company (Record, p. 528; Ans. 49; p. 531, Ans. 68, 69; pp. 539-540, Ans. 113-117; pp. 542, 543, Ans. 130-132) shows that the early Smith scales which his company purchased from the Smiths were provided with computing drums the paper cylinders of which were formed of very heavy paper or cardboard; while the record shows (Hapgood, pp. 288-289, Ans. 47-51, and Defendant's Exhibit Defendant's Untreated Chart Sheet—also Exhibits Complainant's and Defendant's Scales) that the paper cylinders of the computing drums of both complainant's and defendant's scales are formed of very heavy paper, of a thickness approximating the thinner grade of cardboard. Moreover, the record shows (Miller, pp. 255-256, Ans. 34-36; pp. 258-260, Ans. 42-47; Hapgood, pp. 290-299, Ans. 58-91; pp. 308-309, Ans. 134-135) that the weight of the computing drums of defendant's scales (and necessarily those of other scales of a similar character) may be further and very materially increased without affecting the operation or accuracy of the scale.

TOLEDO COMPUTING SCALE COMPANY,
By FRANK P. DAVIS,
EDWARD RECTOR,
Its Counsel.

We hereby certify that in our judgment the above petition for a rehearing is well founded in point of law and ought to be granted.

FRANK P. DAVIS.
EDWARD RECTOR.

And afterwards, to-wit: On the third day of July, 1913, in the October term last aforesaid, the following further proceedings were had and entered of record, to-wit:

Thursday, July 3, 1913.

Court met pursuant to adjournment and was opened by proclamation of crier.

Present:

Hon. Christian C. Kohlsaat, Circuit Judge, presiding.
Hon. George A. Carpenter, District Judge.
Edward M. Holloway, Clerk.
Luman T. Hoy, Marshal.

Before:

Hon. Francis E. Baker, Circuit Judge.
Hon. Christian C. Kohlsaat, Circuit Judge.
Hon. Francis M. Wright, District Judge.

1934

Toledo Computing Scale Company
vs.
The Computing Scale Company.

Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.

It is ordered by the court that the petition for a rehearing in this cause be, and the same is hereby overruled.

UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

I, Edward M. Holloway, Clerk of the United States Circuit Court of Appeals for the Seventh Circuit, do hereby certify that the foregoing printed pages, numbered from 949 to 1003, inclusive, contain a true copy of the proceedings had and papers filed (except the briefs of counsel) in the case of

The Toledo Computing Scale Company

vs.

The Computing Scale Company

No. 1934, October Term, 1911, as the same remains upon the files and records of the United States Circuit Court of Appeals, for the Seventh Circuit.

In testimony whereof I hereunto subscribe my name and affix the seal of said United States Circuit Court of Appeals for the Seventh Circuit, at the City of Chicago, this ~~second~~ 21 day of November, A. D. 1921.

(Seal)

EDWARD M. HOLLOWAY,
Clerk of the United States Circuit Court of Appeals for the Seventh Circuit.